User Guide

MX Sprue Pickers
with PC-E IV control

Models MX60 to MX550, and MX350T to MX550T

Installation

Operation

Maintenance

Troubleshooting

Instant Access
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UGR002/1099

Record your equipment's model and serial number(s) and the date you received it in the spaces provided.

It is important to record the model and serial number(s) of your equipment and the date you received it in the User Guide. Our service department uses this information, along with the manual number, to provide help for the specific equipment you installed.

Keep this User Guide and all manuals, engineering prints and parts lists together for documentation of your equipment.

Date:
Document Number: **UGR002/1099**
Serial number(s): ....
Model number(s): ....
Power Specifications: **Amps** ..... **Volts** ..... **Phase** ..... **Cycle** .....

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PARTS/DIAGRAMS P/D-1

Your User Guide will include one of these three parts packages, depending on the sprue picker model ordered.

Models MX60 to MX150 . . . . . IMR001/1099
Models MX250 to MX550 . . . . . IMR002/1099
Models MX250T to MX550T IMR003/1099

INTRODUCTION

- *Purpose of the User Guide 1-2*
- *How the User Guide is organized 1-2*
- *Your Responsibilities as a User 1-2*
- *ATTENTION: Read this so no one gets hurt 1-3*

PURPOSE OF THE USER GUIDE

This User Guide describes the Conair MX Sprue Pickers and explains step-by-step how to install, operate, maintain and repair this equipment.

Before installing this product, please take a few moments to read the User Guide and review the diagrams and safety information in the instruction packet. You also should review manuals covering associated equipment in your system. This review won't take long, and it could save you valuable installation and operating time later.

HOW THE USER GUIDE IS ORGANIZED

Symbols have been used to help organize the User Guide and call your attention to important information regarding safe installation and operation.

⚠ Symbols within triangles warn of conditions that could be hazardous to users or could damage equipment. Read and take precautions before proceeding.

1 Numbers within shaded squares indicate tasks or steps to be performed by the user.

◆ A diamond indicates the equipment's response to an action performed by the user.

❒ An open box marks items in a checklist.

● A shaded circle marks items in a list.

YOUR RESPONSIBILITY AS A USER

You must be familiar with all safety procedures concerning installation, operation and maintenance of this equipment. Responsible safety procedures include:

- Thorough review of this User Guide, paying particular attention to hazard warnings, appendices and related diagrams.
- Thorough review of the equipment itself, with careful attention to voltage sources, intended use and warning labels.
- Thorough review of instruction manuals for associated equipment.
- Step-by-step adherence to instructions outlined in this User Guide.

⚠ ATTENTION: READ THIS SO NO ONE GETS HURT

We design equipment with the user's safety in mind. You can avoid the potential hazards identified on this machine by following the procedures outlined below and elsewhere in the User Guide.

WARNING: Improper installation, operation, or servicing may result in equipment damage or personal injury.
This equipment should only be installed, adjusted, and serviced by qualified technical personnel who are familiar with the construction, operation, and potential hazards of this type of machine.

All wiring, disconnects, and fuses should be installed by qualified electrical technicians in accordance with electrical codes in your region. Always maintain a safe ground. Do not operate the equipment at power levels other than what is specified on the machine serial plate.

WARNING: Voltage hazard.
This equipment is powered by alternating current, as specified on the machine serial tag and data plate.

A properly sized conductive ground wire from the incoming power supply must be connected to the chassis ground terminal inside the electrical enclosure. Improper grounding can result in severe personal injury and erratic machine operation.

Always disconnect and lock out the incoming main power source before opening the electrical enclosure or performing non-standard operating procedures such as routine maintenance. Only qualified personnel should perform troubleshooting procedures that require access to the electrical enclosure while power is on.

CAUTION: Equipment hazard.
Do not plug an MX Sprue Picker with a PC-E III Control into an interface wired for a PC-E IV Control SPI interface.
Do not plug an MX Sprue Picker with a PC-E IV Control into an interface wired for a PC-E III Control interface.
Damage will occur! Call Conair Service if you are unsure or have any questions.

DESCRIPTION

- *What is the Sprue Picker? 2-2*
- *Typical Applications 2-3*
- *Limitations 2-3*
- *How the Sprue Picker Works . . .2-4*
- *MX Sprue Picker Features 2-5*
- *Specifications 2-6*
- *Optional Equipment 2-7*

WHAT IS THE MX SPRUE PICKER?

The MX Sprue Picker is a pneumatic robot that removes the molded part or sprue runner system from the injection molding machine. Sprue pickers are mounted on a fixed platen on the injection machine. When the mold opens, the robot arm lowers into the mold area, grips the sprue or part and pivots to place the item in a designated area.

The MX Sprue Pickers are available in several models to suit your application needs, including telescopic models when the height of the ceiling is an issue. See Specifications, page 2-7.

MX450

MX150

TYPICAL APPLICATIONS

Conair MX Sprue Pickers are ideal for applications requiring quick, consistent sprue/part removal from either a moveable or stationary platen. The robot interfaces directly with the mold machine to ensure predictable, constant cycle times. This allows accurate time quoting for production and maintenance schedules.

Use the MX Sprue Pickers to eliminate common problems:

- inconsistent cycle times
- improper part/sprue separation
- unsafe sprue/part removal

LIMITATIONS

Choose Conair MX Sprue Pickers based on the size of the injection molding machine you are using.

MX Sprue Picker	For Injection Mold Machine Size, ton
MX60	20 to 60
MX150	60 to 150
MX250	150 to 250
MX350	150 to 350
MX450	150 to 450
MX550*	150 to 550
MX350T	150 to 350
MX550T*	150 to 550

* Contact Conair for suitability of application. Larger presses may be accommodated.

NOTE: Use this table only as a general guide. Application data sheet information determines the proper size of sprue picker for your application. Consult your Conair representative for assistance when choosing a Conair MX Sprue Picker.

HOW THE SPRUE PICKER WORKS

The MX Sprue Picker interfaces with the mold machine. The hand control provides the buttons for controlling and monitoring the sprue picker. From the hand control you can:

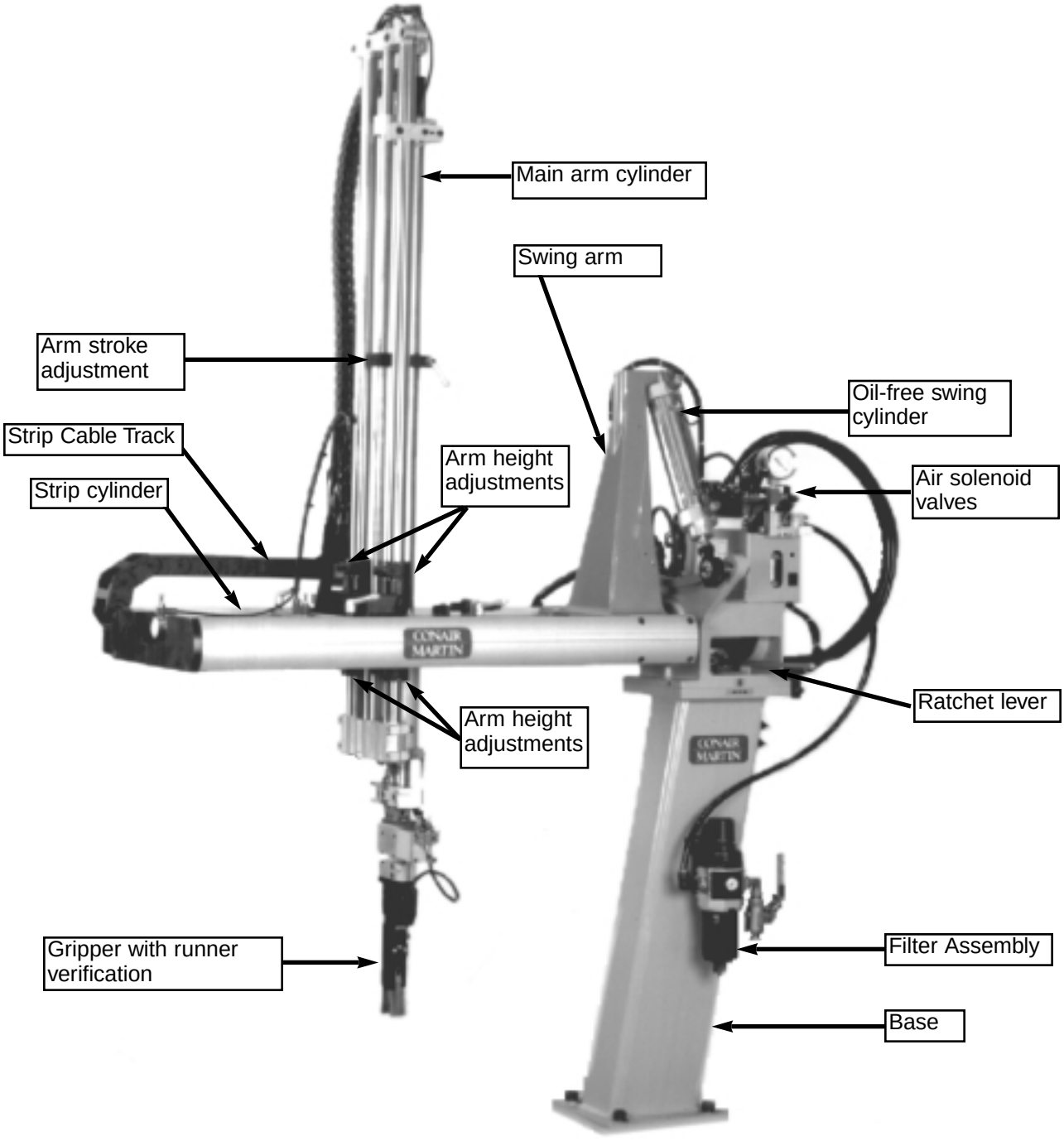
- monitor the input/output status
- set and adjust cycle timers in both manual and automatic mode
- adjust mode settings
- operate the picker manually
- operate the picker automatically
- store programs

The sprue picker sends a signal to the mold machine to begin the cycle. The sprue picker receives the Mold Open signal from the mold machine to remove the sprue/part. The robot arm moves into the mold area, grips the part, and raises out of the mold. The arm pivots outside the press area to release the part/runner. The sprue picker sends a signal to the mold machine to begin the next cycle.

Each sprue picker is equipped with a part verification switch to stop the molding machine if a part is missed.

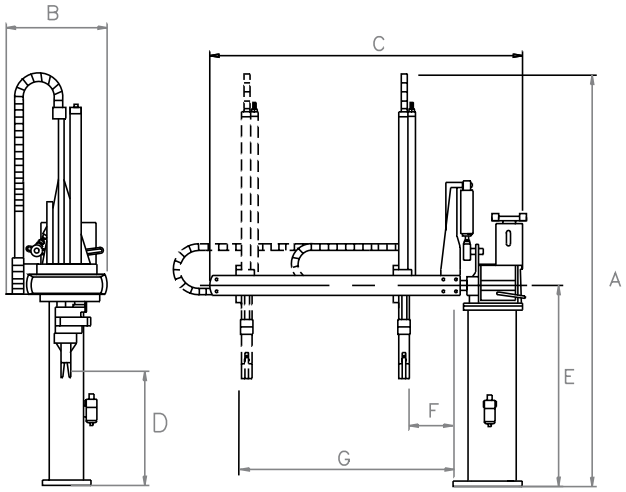
The MX Sprue Picker models have these features:

MX SPRUE PICKER FEATURES

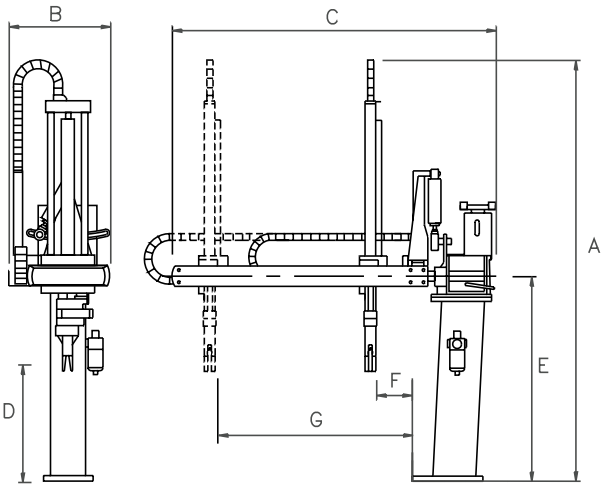


SPECIFICATIONS

MX60-150



MX250-550, MX350T-550T



MODEL	MX-60	MX-150	MX-250	MX-350	MX-350T	MX-450	MX-550	MX-550T
Dimensions, in. {mm}								
A-Height	47.2 {1200}	51 {1300}	67 {1700}	71 {1800}	61.0 {1550}	75 {1900}	79 {2000}	65.0 {1650}
B-Width	11.4 {290}	11.4 {290}	16.1 {410}	16.1 {410}	17.7 {450}	16.1 {410}	16.1 {410}	14.4 {450}
C-Length	23.6 {600}	28.3 {720}	39.8 {1010}	39.8 {1010}	43.3 {1100}	39.8 {1010}	39.8 {1010}	43.3 {1100}
D-Grip Center								
Above Platen	7.1 {180}	7.1 {180}	15.0 {380}	15.0 {380}	12.6 {320}	15.0 {380}	15.0 {380}	12.6 {320}
- with wrist rotation	4.7 {120}	4.7 {120}	7.9 {200}	9.3 {241}	7.4 {188}	9.3 {241}	9.3 {241}	7.4 {188}
E-Swing Point Above Platen	21.9 {557}	21.9 {557}	30.9 {785}	30.9 {785}	30.9 {785}	30.9 {785}	30.9 {785}	30.9 {785}
Strip Stroke Adjustment, F to G								
	2-12.2	2-16.9	3.3-21.1	3.3-21.1	2.8-20.1	3.3-21.1	3.3-21.1	2.8-20.1
	{50-310}	{50-430}	{85-535}	{85-535}	{70-510}	{85-535}	{85-535}	{70-510}
Strip Stroke	12.2 {75}	16.9 {75}	4.9 {125}	4.9 {125}	4.9 {125}	4.9 {125}	4.9 {125}	4.9 {125}
Performance characteristics								
Injection machine size, ton	20 - 60	60 - 150	150 - 250	150 - 350	150 - 350	150 - 450	150 - 550	150 - 550
Swing Angle, ^{o}	45 - 90	45 - 90	45 - 90	45 - 90	45 - 90	45 - 90	45 - 90	45 - 90
Wrist Rotation Angle, ^{o}	90	90	90	90	90	90	90	90
Min. Takeout Time, sec	0.6	0.7	1.2	1.3	1.3	1.4	1.5	1.5
Min. Cycle Time, sec	3	3.2	3.8	4.0	4.0	4.2	4.5	4.5
Weight, lb {kg}								
Installed	56 {25}	60 {27}	124 {56}	126 {57}	130 {59}	128 {58}	132 {60}	134 {61}
Shipping	81 {37}	85 {39}	154 {70}	156 {71}	160 {73}	158 {72}	162 {74}	164 {75}
Physical Characteristics								
Air Consumption, CFM {NI/cycle}	3 {85}	3 {85}	3 {85}	3 {85}	3 {85}	3 {85}	3 {85}	3 {85}
Approximate Max. Payload, lb {kg}								
- w/o wrist rotation	2.2 {1}	2.2 {1}	4.4 {2}	4.4 {2}	4.4 {2}	4.4 {2}	4.4 {2}	4.4 {2}
- with wrist rotation	1.1 {0.5}	1.1 {0.5}	2.2 {1}	2.2 {1}	2.2 {1}	2.2 {1}	2.2 {1}	2.2 {1}
Working Air Pressure, PSI {MPa} @ 3 CFM	80 {11.6}	80 {11.6}	80 {11.6}	80 {11.6}	80 {11.6}	80 {11.6}	80 {11.6}	80 {11.6}
Power Consumption, amps								
115V/1 phase/50-60 Hz	5	5	5	5	5	5	5	5
220V/1 phase/50-60 Hz	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5

**Optional*

OPTIONAL EQUIPMENT

Options available on all models include:

- **Second descent slowdown**
  Controls arm extension speed over gate (descent slowdown).

- **Second ascent slowdown**
  Controls arm retraction speed over gate (ascent slowdown).

- **Venturi vacuum kit**
  Allows the use of vacuum end-of-arm tooling to remove light duty parts.

- **Sprue cutting systems**

- **Extended strip stroke**
  Extends the strip stroke travel distance for deep draw parts (typically used with end-of-arm tooling).

- **End-of-arm tooling**
  Used for light duty part removal.

- **Grip pressure regulator**
  Reduces gripper pressure, preventing sprue/runner from being squeezed flat and causing a false Missed Runner alarm.

INSTALLATION

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UNPACKING THE BOXES

The MX Sprue Picker comes fully assembled in a single crate.

CAUTION: Lifting
To avoid personal injury or damage to the sprue picker, lift the sprue picker using a forklift or hoist with straps that have been positioned at the sprue picker's center of gravity.

1. **Carefully uncrate the sprue picker and its components.**

2. **Remove all packing material,** protective paper, tape, and plastic. Compare contents to the shipping papers to ensure that you have all the parts.

3. **Carefully inspect all components** to make sure no damage occurred during shipping. If any damage is found, notify the shipping agent immediately. Check all wire terminal connections, bolts, and any other electrical connections, which may have come loose during shipping.

4. **Record serial numbers and specifications** in the blanks provided on the back of the User Guide's title page. This information will be helpful if you ever need service or parts.

5. **You are now ready to begin installation.** Complete the preparation steps on page 3-3.

PREPARING FOR INSTALLATION

CAUTION: Moving the Sprue Picker
When you receive the sprue picker, the swing is bolted to prevent movement. On the MX60 to MX150 models, a bolt goes through the swing angle adjustment bracket into the base. This prevents the arm from swinging.

On the MX250 to MX450 models, there is an L-bracket between the swing casting and the base. Leave the swing inhibitor on until the sprue picker is mounted on the press. Remove after mounting.

WARNING: Improper installation, operation, or servicing may result in equipment damage or personal injury.
This equipment should only be installed, adjusted, and serviced by qualified technical personnel who are familiar with the construction, operation, and potential hazards of this type of machine.

All wiring, disconnects, and fuses should be installed by qualified electrical technicians in accordance with electrical codes in your region. Always maintain a safe ground. Do not operate the equipment at power levels other than what is specified on the machine serial tag and data plate.

Plan the location. Make sure the area where the sprue picker is installed has:

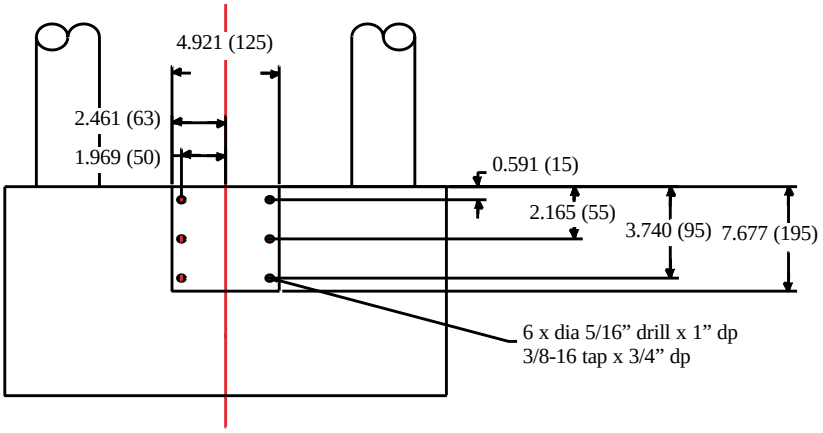
- **A grounded power source.** Check the sprue picker's serial tag for the correct amps, voltage, phase, and cycle. All wiring should be completed by qualified personnel and comply with your region's electrical codes.

- **Clearance for safe operation and maintenance.** Make sure there is enough clearance around the sprue picker for movement, maintenance and servicing. Be sure the sprue picker has proper clearance to avoid structures, utilities, overhead cranes, and loading pipes, as well as other machines and equipment. Be sure that the maximum envelope is clearly marked and protected from entry by personnel during operation. The maximum envelope is the volume of space encompassing the maximum designed movement of ALL robot parts, including the end of arm tooling, work piece and attachments.

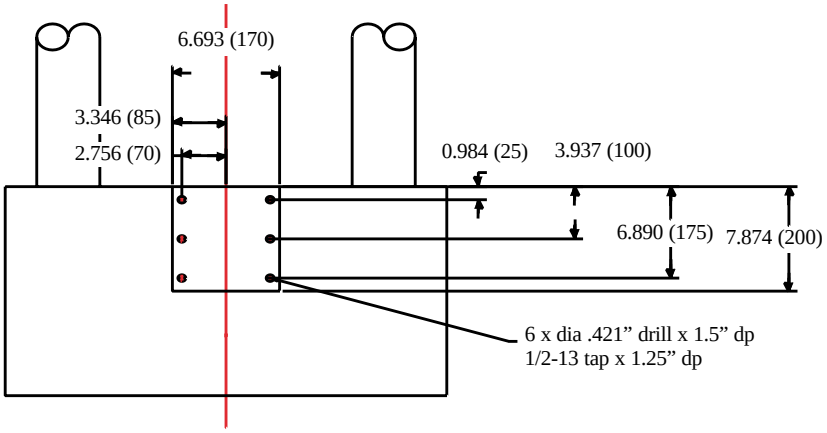
PREPARING THE PLATEN

You need to drill holes in the stationary (fixed) platen to accept the sprue picker.

Mounting pattern for Models MX60 to MX150*



Mounting pattern for Models MX250 to MX550*



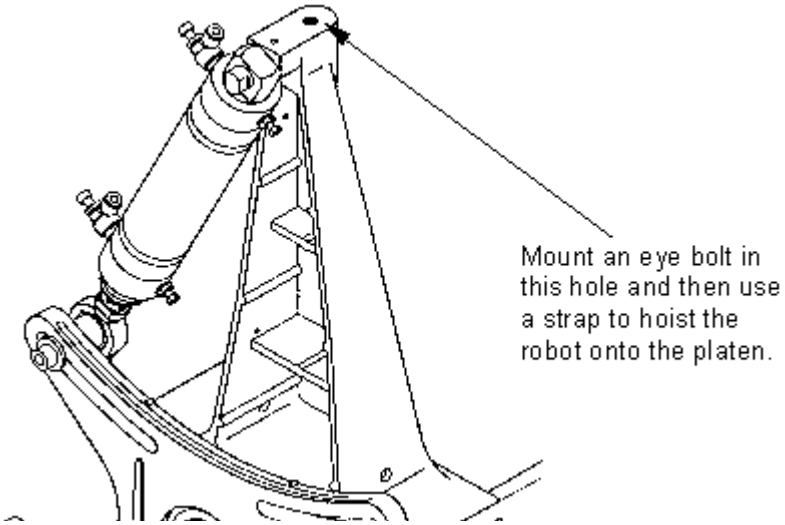
*Dimensions shown are inches (mm).

POSITIONING THE SPRUE PICKER

CAUTION: Lifting
To avoid personal injury or damage to the sprue picker, lift the sprue picker using a hoist. Place the straps around the swing shaft between the strip frame and the base.

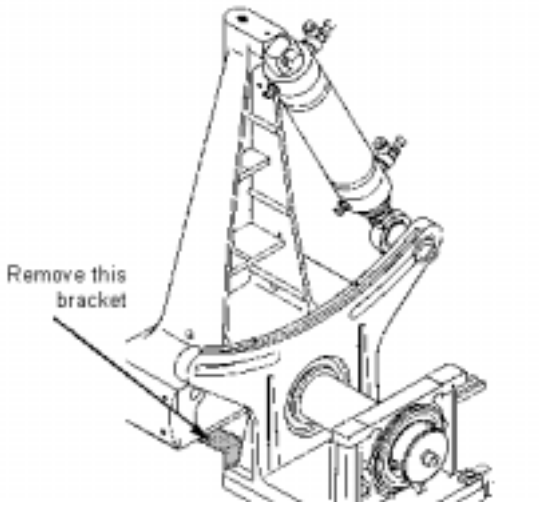
1 **Mount an eye bolt in the eyehole.**

2 **Move the sprue picker into position.**
Using a strap, hoist the sprue picker into position on the platen.



3 **Secure the sprue picker to the platen**
with the supplied screws, lock washers, and flat washers.

4 **Remove the swing inhibitor.**

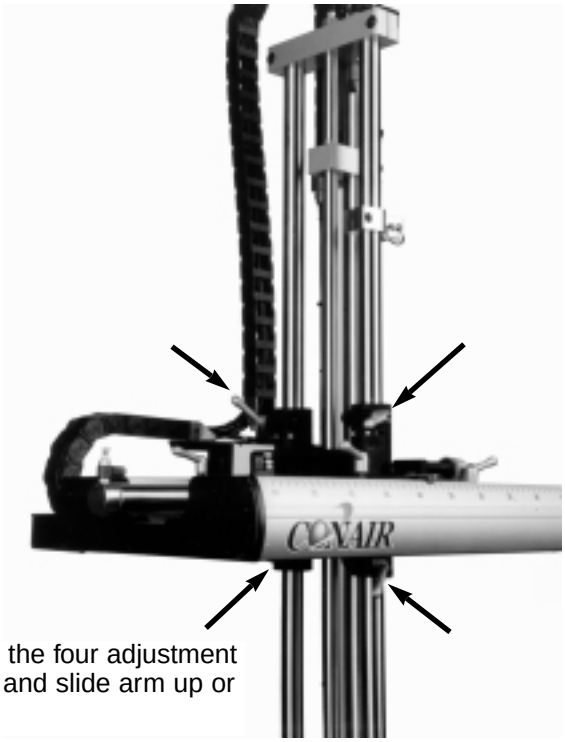


SETTING GRIPPER HEIGHT

The gripper height, from the top of the platen to the gripper center, may require adjustment once the picker is mounted on the press. The arm height is lowered to minimize the shipping height of the picker. The procedure is the same for all sprue pickers.

1 **Hold the main arm** and loosen the four arm height adjustment screws.

CAUTION: Equipment damage
Hold the main arm securely when loosening the screws to prevent the arm from dropping quickly and causing equipment damage.



Loosen the four adjustment screws and slide arm up or down.

2 **Set the gripper height** to the desired position by moving the arm up and down.

3 **Tighten the arm height adjustment screws securely.**

CONNECTING THE MAIN POWER SOURCE

WARNING: Electrical hazard
Before performing any work on this product, disconnect and lock out electrical power sources to prevent injury from unexpected energization or start-up.

WARNING: Improper installation, operation, or servicing may result in equipment damage or personal injury.
This equipment should only be installed, adjusted, and serviced by qualified technical personnel who are familiar with the construction, operation, and potential hazards of this type of machine.

All wiring, disconnects, and fuses should be installed by qualified electrical technicians in accordance with electrical codes in your region. Always maintain a safe ground. Do not operate the equipment at power levels other than what is specified on the machine serial tag and data plate.

WARNING: Crushing Injury
This device has high speed moving parts that can cause crushing injuries. Keep body parts and clothing away from moving parts. Always disconnect the sprue picker from compressed air sources before servicing.

Do not operate machine unless you are trained and have read and understood this user guide.

1 **Disconnect and lock out main power supply** to which the sprue picker will be connected.

2 **Inspect the wiring of the sprue picker and the** IMM SPI interface connections.

3 **Connect the sprue picker SPI plug** to the IMM SPI receptacle.

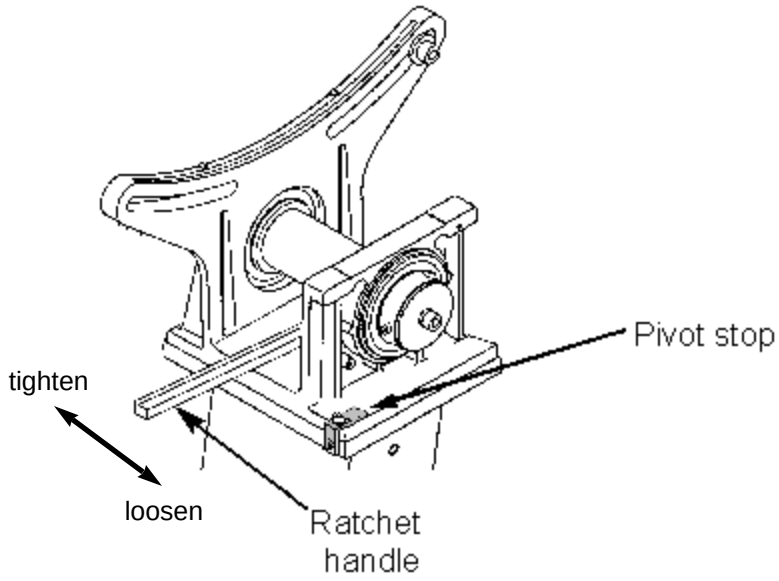
4 **Apply main power to the IMM interface.**

IMPORTANT: *Always refer to the wiring diagrams that came with your sprue picker before making electrical connections. The diagrams show the minimum size main power cable required for your sprue picker, and the most accurate electrical component information.*

ADJUSTING THE PIVOT

The MX Sprue Picker strip frame can pivot to move the picker out of the way when the mold is changed. You need to adjust the pivot stop so that the axis of the strip frame is parallel with the base of the press. The stop allows the picker to pivot back into position after the mold change.

Adjust the pivot stop, if required, to compensate for any misalignment of the bolt pattern after installation.



ADJUSTING SWING ANGLE AND DISCHARGE SIDE

You can easily change the sprue picker/runners to release parts to either side of the press by changing the swing cylinder position.

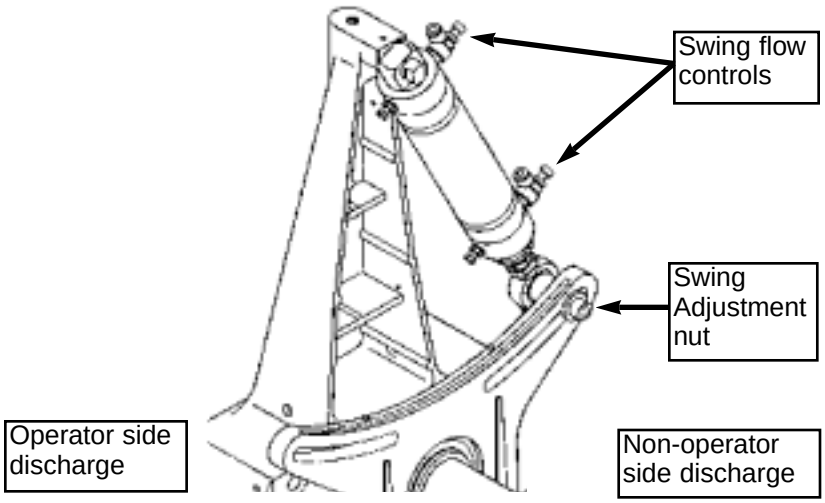
WARNING: Air pressure hazard
When adjusting the swing, turn OFF compressed air to the sprue picker. Disconnect the air supply before making any adjustments!

1 **Exhaust the air supply completely.**

2 **Loosen the Swing Adjustment nut.**

3 **Set the direction and the angle**
by moving the cylinder mounting in the bracket slot.

4 **Tighten the nut** securely after the adjustment.



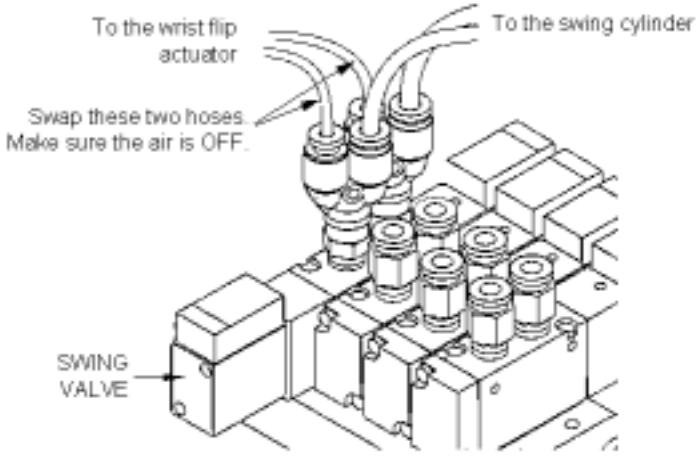
CHANGING THE WRIST FLIP

WARNING: Air pressure hazard
When making adjustments to the wrist flip, turn OFF compressed air to the sprue picker. Disconnect the air supply before making any adjustments!

1 **Disconnect and exhaust the air supply completely.**

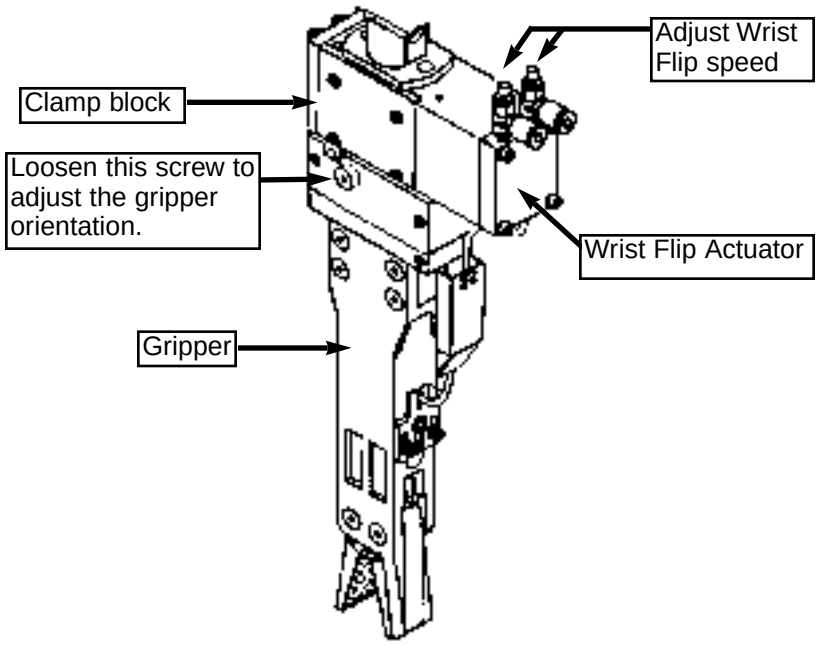
2 **Swap the hoses for the wrist flip actuator.**
This is done at the swing valve. The wrist flip is actuated with the swing motion:

Swing out = wrist flip out
Swing in = wrist flip home.



3 **Turn the air on** and return the arm to the vertical position (swing is in). The gripper is rotated 90° the wrong way. The gripper must now be repositioned on the wrist flip actuator to bring the gripper assembly into the proper orientation.

4 **Loosen the screw on the clamp block** that secures the gripper assembly to the wrist flip actuator.



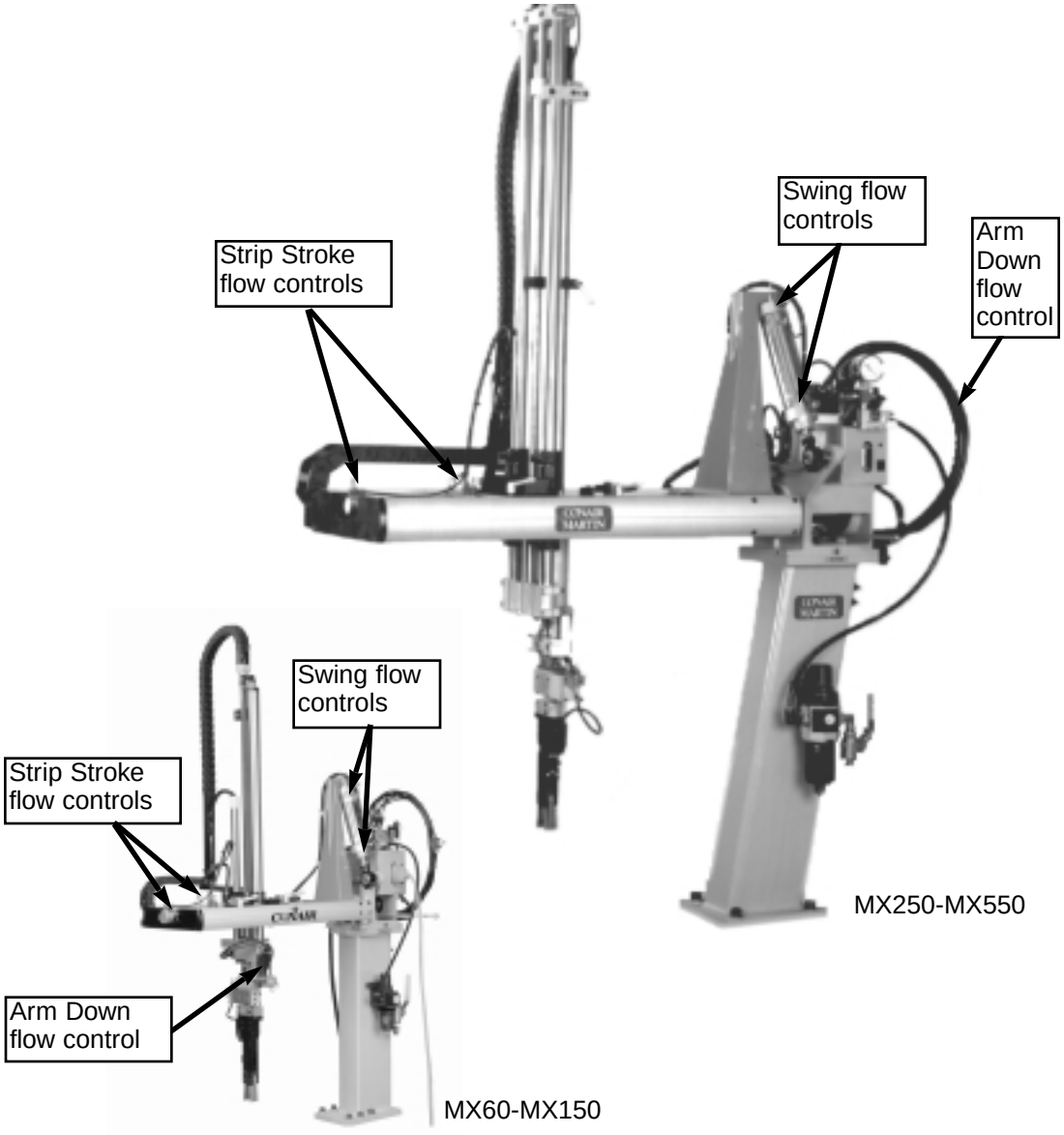
5 **Turn the gripper by hand** back into the position shown above.

6 **Tighten the clamp screw** to lock the gripper in position on the wrist flip shaft.

ADJUSTING THE SPEED

The flow controls are used to adjust the picker speeds. You can adjust the Strip Action flow controls, the Arm Down flow control, and the Swing Motion flow controls.

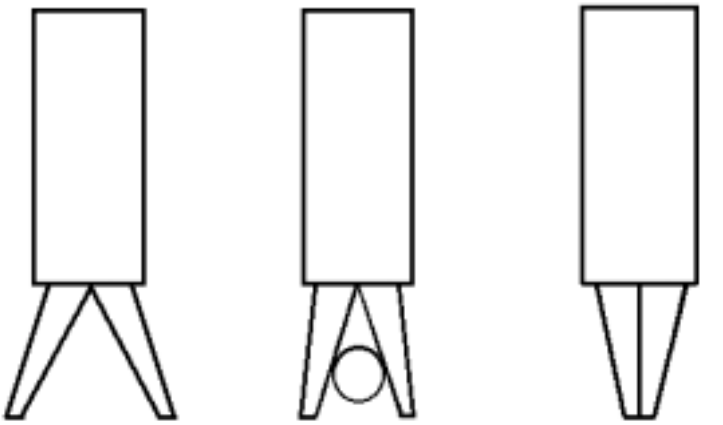
Loosen lock nut and turn the flow control knobs clockwise to slow the picker. Turning the controls counter-clockwise causes the picker to speed up. Tighten the lock nut after making adjustments.



ADJUSTING THE SPRUE VERIFICATION SWITCH

To ensure proper part/sprue verification, adjust the LS-4 switch.

1. **Use the manual grip key to cycle** the gripper open and closed while in the mold area or over the gate area.
2. **Place a sprue into the open gripper jaws** and manually grip the sprue with the gripper.
3. **Adjust the LS-4 proximity sensor** to achieve the following:



Gripper open
LS-4 off

Gripper with
Sprue
LS-4 on

Gripper closed
LS-4 off

4. **Loosen and slide the switch on the gripper.** Adjust it to achieve the conditions show above.
5. **When adjusted, tighten the switch securely.**

NOTE: Check this verification regularly to ensure the picker is correctly verifying the part/sprue removal. The adjustment may need reset if the sprue diameter changes (due to mold changes). If the gripper crushes the sprue completely, an optional grip regulator can be added to decrease the pressure used to grip the sprue.

VERIFYING THE ELECTRICAL INTERFACE

The electrical interface between the sprue picker and the injection molding machine is the most important part of the installation. The interface must function correctly to maintain the safety of the sprue picker and the mold. As a result, the interface must be verified.

CAUTION: Equipment hazard.
Do not plug an MX Sprue Picker with a PC-E III Control into an interface wired for a PC-E IV Control SPI interface.
Do not plug an MX Sprue Picker with a PC-E IV Control into an interface wired for a PC-E III Control interface.
Damage will occur! Call Conair Service if you are unsure or have any questions.

Electrical Diagrams are in the Appendix, beginning on page A-9.

The areas that must be verified as functional and correct are the motion controls and the inputs.

Verifying motion controls (permissives)

The control of the clamp movements is critical. The sprue picker must control the following motions for safety. Check the following movements:

- **Mold Close**
  The sprue picker must control the closing motion of the mold. If the sprue picker is not clear of the mold area, the press close must be inhibited. Also, if the sprue picker misses a part, the press must be inhibited from closing.

- **Mold Open**
  The opening of the mold must be controlled by the sprue picker. If the arm is not in a safe area - Fully Up or Outside the press area - the injection molding machine should not be permitted to open.

- **Mold Ejection (Forward)**
  The ejection of the part can be controlled by the sprue picker. This ensures the proper placement of the sprue picker gripper before the sprue/runner is ejected.

- **Cycle Start (optional)**
  This option sends a signal from the sprue picker to the IMM after the mold closes to tell the IMM to begin a new cycle.

Verifying the Inputs

The first four inputs must be verified. The others are optional depending on the application.

Verify the following inputs as functional and correct:

- **Mold Full Open**
  This signal starts the sprue picker into the mold area. This is a very important signal. If the sprue picker enters, or attempts to enter the mold at the wrong time, damage to the arm and/or mold can occur.

- **Mold Full Closed**
  This signal is sent to the sprue picker when the mold is fully closed or locked up.

- **Press Gate Closed**
  This signal tells the sprue picker that the safety gate is closed.

- **Press Auto**
  The sprue picker must see this signal to cycle automatically.

- **E-Stop from IMM**
  The sprue picker monitors the emergency stop message from the IMM. If the sprue picker senses the message from the IMM, the sprue picker stops.

- **Reject Part**
  The IMM signals the sprue picker there is a rejected part. The sprue picker grabs the part, strips it and immediately releases it without moving it outside.

CHECKING THE ELECTRICAL INTERFACE

WARNING
This verification is critical. The sprue picker must control these for safety concerns.

To check the Open/Close permissives:

1. **With the arm above the mold** remove the inputs for Arm is Full Up (LS-3) or Unit Outside Clear/Fully Out. This will make the robot appear to be in an unsafe condition.

2. **With these inputs disabled,** attempt to open and close the mold.

CAUTION
If the mold moves at all, the sprue picker is not controlling the press movement, the interface is not correct. Do not attempt to run the sprue picker under this condition. The situation needs correction! Do not just remove the interlock relays and assume that this is verification enough. This gives no indication of the output status of the permissive. Perform all the steps listed here.

3. **Isolate the power of the press** from the sprue picker's power by the use of relays.

4. **Do not use the relays in the PC-E IV control** to interrupt press solenoids directly. Use isolation relays with adequate amp capacity for this purpose.

5. **The inputs from the press to the sprue picker** should provide dry contact closures to allow the robot to send its own voltage to the contact and use this voltage to power the input.

PREPARING FOR TESTING

1. **Make sure all components** are installed according to assembly drawings. Make sure that all bolts on the sprue picker have been tightened.
2. **Check that sprue picker is firmly locked** into position with the anchoring screws.
3. **Check that all wiring conforms to electrical codes**, and all wiring covers are in place.

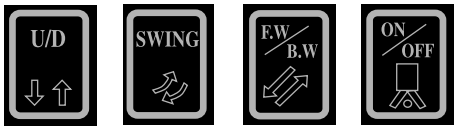
TESTING THE INSTALLATION

1. **Plug in the main power cord** and turn on the main disconnect. The display should fully illuminate and perform its bootup routine.
2. **Check that the E-Stop button is in the out, extended position.**
   Turn the E-Stop button clockwise (in the direction of the arrows) to verify that the button is in the out, extended position.

3. **Move mold to Full Open position** with the IMM in manual mode.
4. **Press the Stop button.**
   This places the control in the Stop mode.

5. **Press the Manual button.**

6. **Cycle the sprue picker**
   by pressing the movement control buttons.



7. **Adjust the flow controls for smooth operation.**

If the sprue picker is not working properly at any time, turn it off immediately and refer to the Troubleshooting section of this User Guide.

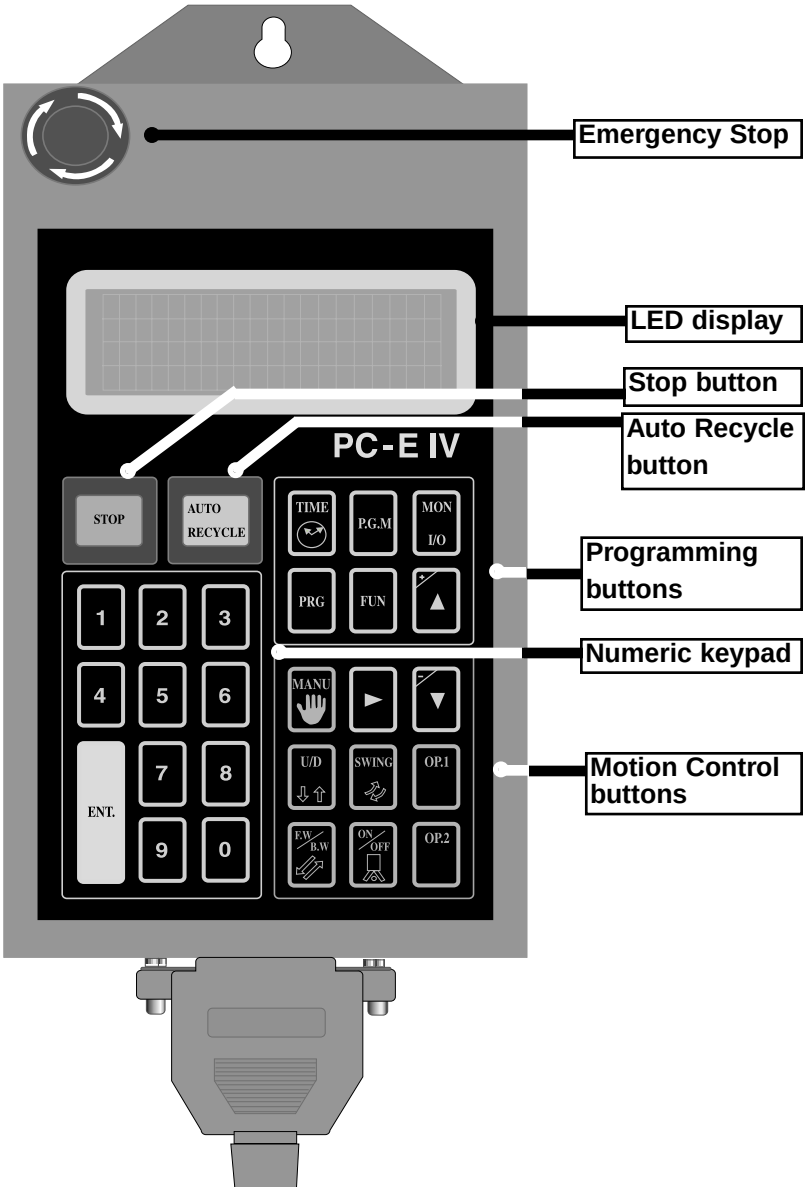
If you do not encounter any problems during testing, proceed to the Operation section.

OPERATION

- *Hand Control Features 4-2*
- *Before Starting 4-3*
- *Starting the Sprue Picker 4-3*
- *Viewing Information 4-4*
- *Choosing the Mold 4-5*
- *Programming the Motion Sequence 4-6*
- *Programming Grip, Vacuum, and Home Position 4-8*
- *Monitoring Input/Output 4-10*
- *Viewing Timer Settings 4-11*
- *Choosing Timer Settings 4-12*
- *Setting Timer Values 4-13*
- *Operating Manually 4-14*
- *Starting Automatic Operation 4-15*
- *Restarting Automatic Operation 4-16*
- *Answering an Alarm 4-17*
- *Stopping the Sprue Picker 4-18*
- *Emergency Stopping 4-18*

HAND CONTROL FEATURES

The sprue picker control has several features that allow you to input setup information, monitor input/output, change modes, and view errors.



BEFORE STARTING

Before you start daily operation of the sprue picker, perform preventative maintenance. This incudes daily, weekly, monthly and semi-annual maintenance. Maintenance procedures are described in the Maintenance section of this Users Guide, beginning on page 5-1.

WARNING: Be sure that power to the sprue picker is disconnected and locked out when doing any maintenance on it. Follow all safety rules when performing any maintenance on this equipment.

STARTING THE SPRUE PICKER

The power must be on for any picker or press operations to occur.

Off Mode

When the picker is in the Off position, the press operates without the sprue picker. The interlock signals for the mold are released. The interlocks are still monitored, however, to ensure the picker is in a safe position for opening and closing the mold.

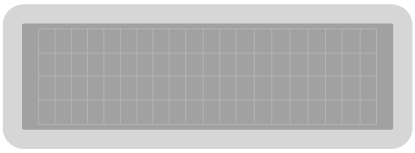
NOTE: When in the Off mode, the sprue picker does not remove parts/sprues from the press. The operator must do it.

On Mode

In the On position the picker runs with the press. The operator can cycle the picker in either manual mode or automatic mode.

VIEWING INFORMATION

The LED on the control displays the data you input, the status of the sprue picker, and any error messages.

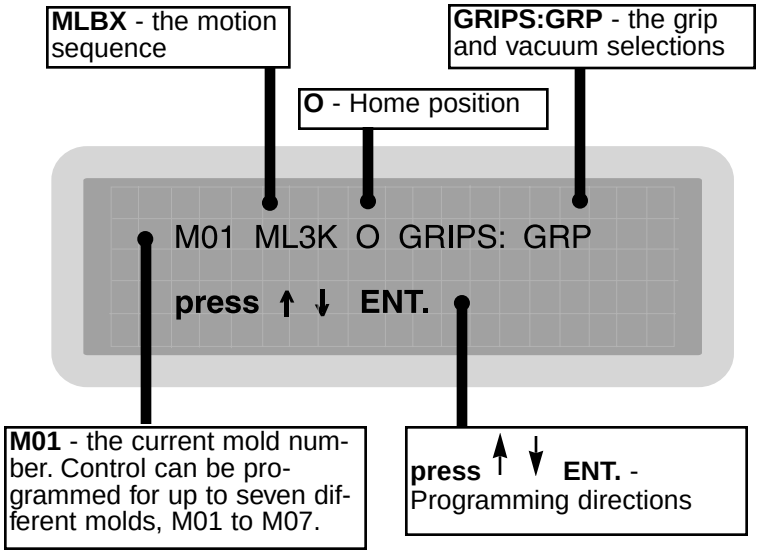


During normal operation the display provides:

- the current mold number
- the motion sequence
- current home position
- the current valve selection
- programming directions

During an alarm or error, the display lists the alarm or error codes.

A typical display during normal operation is:


MLBX - the motion sequence
GRIPS:GRP - the grip and vacuum selections
O - Home position
M01 ML3K O GRIPS: GRP
press ↑ ↓ ENT.
M01 - the current mold number. Control can be programmed for up to seven different molds, M01 to M07.
press ↑ ↓ **ENT.** - Programming directions

CHOOSING THE MOLD

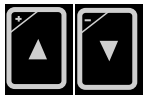
You can choose any one of seven different molds, from M01 to M07. The control must be in the Stop mode.

To choose the mold:

1 Press the Stop button.
The sprue picker stops. The control must be in the Stop mode to choose a mold.

2 Press the Program button.
The mold number is highlighted on the display.

3 Use the Up and Down arrows
to move sequentially through the mold numbers, M01 to M07. Each mold number displays with each press of the arrows.



4 Press the Enter button.
When the mold number you want displays, press the Enter button to choose that mold number.

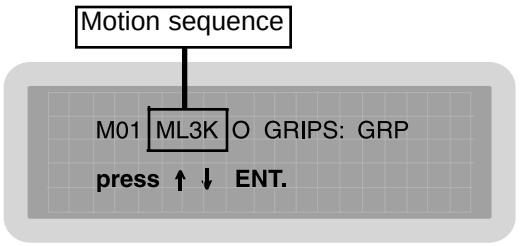
5 Press the Stop button
to return to the Stop mode.

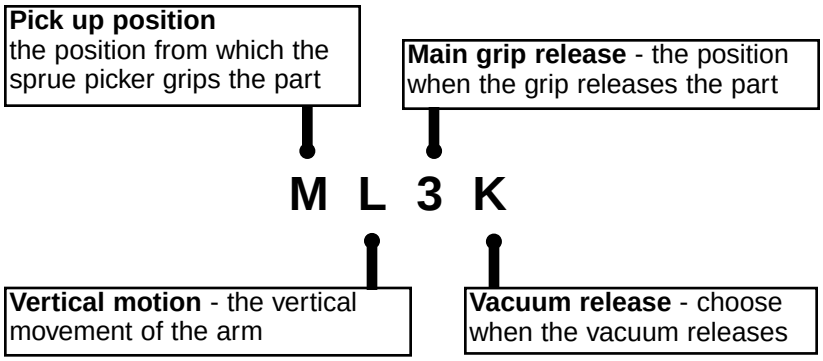
PROGRAMMING THE MOTION SEQUENCE

To view the program motion sequence patterns, see Motion Sequences in the Appendix, beginning on page A-13.

Before choosing the various motion sequences, be sure you have chosen the appropriate mold number (see Choosing the Mold, page 4-5).

Decide which movements you wish the sprue picker to make. Four different movements can be programmed.
There are two choices for each of the four letters of the motion sequence.




Pick up position
the position from which the sprue picker grips the part
Main grip release - the position when the grip releases the part
M L 3 K
Vertical motion - the vertical movement of the arm
Vacuum release - choose when the vacuum releases

Choose the sequence position:

Sequence Position	Choose	
Pick up position	m*	Pick up from Moveable mold
	f	Pick up from Fixed mold
Vertical motion	L*	Lower vertical motion sequence
	U	Upward vertical motion sequence
Main grip release	2*	Second extend. Grip release at arm second extend.
	K	Second extend and strip. Grip release at arm second extend and strip motion.
	3	On the way third. Part released on the way arm third extended.
	M	In mold. Part release in the mold area.
Vacuum release	2*	Second extend. Vacuum release at arm second extend.
	K	Vacuum release at second arm extended and trip motion.
	3	On the way 3rd descend. Vacuum release on the way arm third extended.
	M	In mold. Vacuum release in mold area (strip back end).

**Default position.*

PROGRAMMING THE MOTION SEQUENCE CONT'D

Program the motion sequence when in the Stop mode. To program the motion sequence:

1 **Press Stop button.** The control goes to Stop mode.

2 **Press Program button.** The current motion sequence information displays.

```
M01  (PROGRAM SET)
P0:  pick up from
m: movable mold
press  ↑↓  ENT.
```

To view the program motion sequence patterns, see Motion Sequences in the Appendix, beginning on page A-13.

3 **Use the Up and Down arrows** to move sequentially through the mold sequence positions. Each mold sequence position underlines each time the Up or Down arrow is pressed.

4 **Use the Move Right arrow** to toggle between the choices for that motion sequence position. Each time the arrow is pressed, the cursor moves to the next letter/number and underlines it.

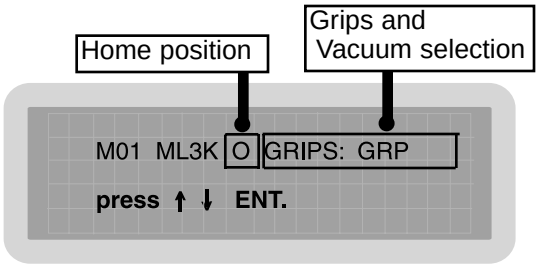
5 **Continue to move** through the motion sequence positions using the Up/Down arrows and the Move Right arrow until you make all your choices.

6 **Press the Enter button.** After making all of your choices for the motion sequence, press the Enter button to program your choice.

7 **Press the Stop button.** To continue, press the Stop button.

PROGRAMMING GRIP, VACUUM, AND HOME POSITION

After choosing the mold number (see Choosing the Mold, page 4-5) and programming the motion sequence (see Programming the Motion Sequence, page 4-6) you need to program the grip, vacuum, and home position.



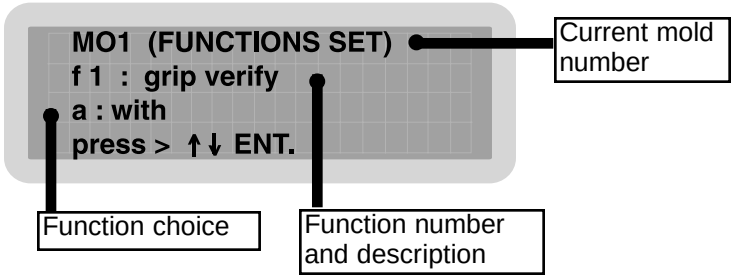
The choices include:

I	Home position above mold
O	Home position outside mold

To program the home position:

1 **Press the Stop button.**
The control goes to Stop mode.

2 **Press the Function button.**
The current Functions positions display for the chosen mold number.



3 **Choose the function and function choices**
you want for the mold number listed on the display. The functions and function choices for each include:

PROGRAMMING GRIP, VACUUM AND HOME POSITION

CONT'D

Function	Description	Function choices	Description
f0:	Grip solenoid	a: b:	with* without
f1:	Grip verify	a: b:	with switch* without switch
f2:	Vacuum solenoid	a: b:	without* with
f3:	Vacuum verify	a: b:	with switch* without switch
f4:	Home position	a: b:	above mold* outside mold

**Default setting*

4 **Use the Up and Down arrows** to scroll through the functions, f0 through f4. The current function is highlighted.

5 **Use the right arrow to choose** the function choices (a, b). The current function choice is highlighted.

6 **Press the Enter button.** After you make your choicse press the Enter button to program your choices.

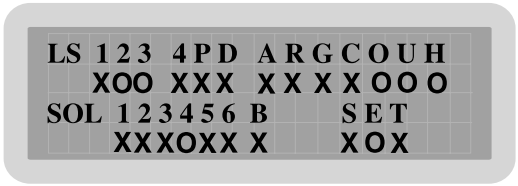
7 **Press the Stop button to continue.**

MONITORING INPUT/OUTPUT

You can monitor the status of all inputs and outputs between the sprue picker and the injection molding machine. The input/output display can be viewed when the sprue picker is in Automatic mode or Manual mode.

To view input/output, press the Monitor Input/ Output button (Mon I/O).

The LCD displays input information (LS) and output information (SOL):



where X shows which switches/valves are OFF and O shows which ones are ON.

Input/Output	Description
LS1	Swing outward end proximity switch
LS2	Swing inward end proximity switch
LS3	Main arm retract end proximity switch (arm up)
LS4	Part (grip) verification switch
LSP	Vacuum differential switch
LSD	Main arm extend end proximity switch
LSA	Press in auto signal
LSR	Rejected part signal
LSG	Gate guard signal
LSC	Mold fully closed signal
LSO	Mold fully open signal
LSU	Sprue picker ON/OFF signal
LSH	Sprue picker home position signal
SOL1	Swing outward solenoid valve
SOL2	Swing inward solenoid valve
SOL3	Main arm extend/retract solenoid valve
SOL4	Strip forward-backward solenoid valve
SOL5	Main arm grip solenoid valve
SOL6	Vacuum solenoid valve
SOLB	Option solenoid valve
SOLS	Mold area free; permit clamp motion output
SOLE	Permit ejector forward output
SOLT	Emergency stop from sprue picker output

Press the Mon I/O button again to return to the previous control display.

VIEWING TIMER SETTINGS

The sprue picker allows you to set time delays for:

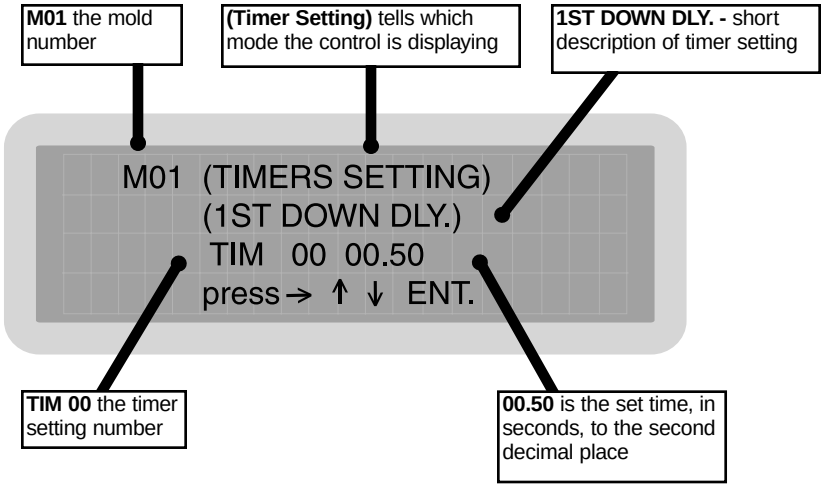
- arm movements
- part ejection
- grip and vacuum
- cycle monitor
- options
- alarms

Up to 15 different timers can be set. Timers can be fine tuned while the picker is running in Automatic.

To view the timer settings, press the Forward button.

The current timer settings display, one at a time, on the display. Scroll through the timer settings by pressing the Forward button (see table, page 4-13).

The timer setting displays as:


M01 the mold number
(Timer Setting) tells which mode the control is displaying
1ST DOWN DLY. - short description of timer setting
M01 (TIMERS SETTING)
(1ST DOWN DLY.)
TIM 00 00.50
press → ↑ ↓ ENT.
TIM 00 the timer setting number
00.50 is the set time, in seconds, to the second decimal place

Choose the timer setting you want from the table. See Choosing Timer Settings, page 4-12.

CHOOSING TIMER SETTINGS

Timer Setting	Description	LCD Displays
TIM00	First down delay	TIMERS SETTING 1ST DOWN DLY. TIM00 ##.##
TIM 01	Eject delay timer	TIMERS SETTING EJECTOR DLY. TIM01 ##.##
TIM 02	Strip forward delay timer	TIMERS SETTING STRIP F/W DLY. TIM02 ##.##
TIM 03	Grip (vacuum) delay timer	TIMERS SETTING V+G ON DLY. TIM03 ##.##
TIM 04	Strip backward delay timer	TIMERS SETTING STRIP B/W DLY. TIM04 ##.##
TIM 05	Arm first retract delay timer	TIMERS SETTING 1 ST UP DLY. TIM05 ##.##
TIM 06	Grip or vacuum release delay timer	TIMERS SETTING V/G 1 OFF DLY. TIM06 ##.##
TIM 07	Arm second retract delay timer	TIMERS SETTING 2ND UP DLY. TIM07 ##.##
TIM 08	Cycle time monitor timer	TIMERS SETTING CYCLE TIM DLY. TIM08 ##.##
TIM 09	Strip forward delay timer after arm retract motion	TIMERS SETTING STRIP O/W DLY. TIM09 ##.##
TIM 10	Optional delay timer	TIMERS SETTING OPTION DLY. TIM10 ##.##
TIM 11	Optional delay timer	TIMERS SETTING OPTION DLY. TI11 ##.##
TIM 12	Grip or vacuum second release delay timer	TIMERS SETTING V/G 2 OFF DLY. TIM12 ##.##
TIM 13	Third arm retract delay timer	TIMERS SETTING 3RD UP DLY. TIM13 ##.##
TIM 14	Optional timer	TIMERS SETTING OPTION DLY. TIM14 ##.##
TIM 15	Alarm Off delay timer	TIMERS SETTING ALARM OFF DLY. TIM15 ##.##

SETTING TIMER VALUES

Timer values can be set and changed while the sprue picker is in operation, or when the sprue picker is stopped.

To set the timers:

1 **Press the Time button.**

2 **Press the Up and Down buttons** to scroll to the chosen timer setting (TIM00 to TIM15).

3 **Press the Forward button** The cursor displays under the first number to move the cursor to the next digit on the screen.

4 **Enter the new timer value.** Press the number for the timer value you want to set. The cursor moves to the next digit automatically.

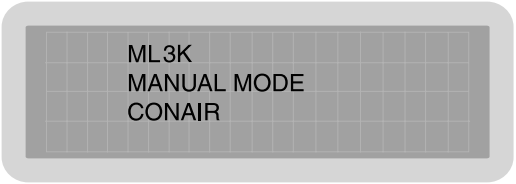
5 **Press the Enter button.** The control accepts the entries and returns to the previous display screen.

OPERATING MANUALLY

In manual mode you can operate the sprue picker manually using the control buttons. To operate the sprue picker manually:

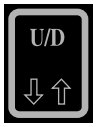
1 **Make sure the sprue picker is stopped** and the mold is fully opened. Press the Stop button and verify the control displays Stop Mode.

2 **Press the Manual button.**
The LCD displays:



The sprue picker is now in manual mode and can be operated using the motion control buttons on the control.

Up/down button



This button vertically moves the main arm up and down (extends and retracts). Press once to extend the arm; press again to retract. The gripper can grip in the down position, but does not grip in the up position.

Swing button

Use this button to swing the arm outward and to swing the arm inward. The arm can swing from the up, forward, and backward positions, but not from the down position.

Forward Strip/Backward Strip button

Press this button to move the arm forward backward (strip). Press the button to strip forward; press again to strip backward. The gripper cannot grip in the forward strip or backward grip positions.

Grip (On/Off) button

Press the Grip button to manually grip a part/sprue. Press again to release the part. The Grip button only works when the arm is in the up position or in the swing out position.

STARTING AUTOMATIC OPERATION

Before placing the sprue picker into automatic operation, the Auto signal from the press must be present for the sprue picker to run. To start automatic operation:

Press the Stop button.
The sprue picker stops. If the arm is not in the Home position, press the Manual button and move the arm to the Home position, then press the Stop button.

Press the Auto/Recycle button.
The control displays the auto mode information and the sprue picker begins automatic cycling.

CAUTION

Press the Auto/Recycle button only when the sprue picker is stopped and in the home position. If the button is pressed at any other time in the cycle of the sprue picker:

- The sprue picker stops
- The alarm sounds
- The error code displays on the hand control

Press the Stop button to silence the alarm.

RESTARTING AUTOMATIC OPERATION

To restart the automatic operation cycle when the sprue picker stops due to a part/sprue pickup failure:

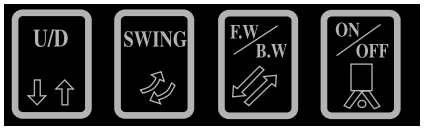
1 **Open the safety door** and verify that there is no part/sprue in the mold. If there is, remove it manually.

CAUTION: Clearing mold area.
It is the responsibility of the operator to verify that the mold area is clear after a missed parts condition. Follow all warnings and precautions for the mold machine before removing parts. Do not enter maximum envelope area while machine is operating.

2 **Press the Stop button.**

3 **Press the Manual button.**

4 **Use the Motion Control buttons** to return the main arm to the home position.



5 **Press the Auto/Recycle button**
The sprue picker begins automatic operation and the LCD displays the Auto Mode message:

ANSWERING AN ALARM

When an error occurs during operation, the sprue picker stops, an alarm sounds and the error code displays on the hand control. Press the Stop button to silence the alarm. Check this table for a description of the error:

Error Display	Area of problem
LS1 SWITCH ERROR OR NOT ACTUATED CHECK LS1 SWITCH	LS-1 swing-out proximity switch error or the switch was not actuated.
LS2 SWITCH ERROR OR NOT ACTUATED CHECK LS2 SWITCH	LS-2 swing-in proximity switch error or the switch was not actuated.
LS3 SWITCH ERROR OR NOT ACTUATED CHECK LS3 SWITCH	LS-3 arm-up proximity switch error or the switch was not actuated.
LS4 SWITCH ERROR OR NO PARTS VERIF. CHECK LS4 SWITCH	LS-4 part (grip) verification switch error or the switch was not actuated.
TIMER#08 ERROR CYCLE TIM EXCEEDED CHECK TIM 08	The Timer 08 cycle time is over.
LSO SWITCH ERROR OR INTERUP. SIGNAL CHECK LSO SWITCH	LS-O mold fully open switch error.
LSD SWITCH ERROR OR NOT ACTUATED CHECK LSD SWITCH	LS-D arm descend end proximity switch error or the switch was not actuated.
LSG SWITCH ERROR OR NOT ACTUATED CHECK LSG SWITCH	LS-G safety gate signal error.
LSP SWITCH ERROR OR NOT ACTUATED CHECK LSP SWITCH	LS-P vacuum verification switch error or the switch was not actuated.
LSH SWITCH ERROR OR NOT IN HOME CHECK LSH SWITCH	LS-H robot home position switch error or sprue picker not at home position.
OUTPUT SHORT	Short circuit in the solenoid valve(s) output circuit.

Go to the Troubleshooting section of this User Manual to correct any problems.

STOPPING THE SPRUE PICKER

To stop the sprue picker from either Auto mode or Manual mode, press the Stop button.

The LCD displays the message:

EMERGENCY STOPPING

If, at any time, you need to immediately stop the sprue picker, press the Emergency stop button.

The sprue picker stops immediately. The control displays:

After the emergency is handled, reset the control by turning the E-stop button in the direction of the arrows (clockwise).

Press the Stop button to place the sprue picker in Stop mode. Continue operation by then pressing the Auto/Recycle button or the Manual button.

MAINTENANCE

- *Maintenance Features 5-2*
- *Warnings and Cautions 5-2*
- *Preventative Maintenance Schedule 5-4*
- *Checking Electrical Connections 5-6*

MAINTENANCE FEATURES

The MX Sprue Picker models need regular, scheduled maintenance for peak performance. Among the features that require maintenance are:

- ❒ Mechanical parts
- ❒ Electrical parts

WARNINGS AND CAUTIONS

To maintain the best performance of the sprue picker, it must be inspected regularly. Maintenance includes a daily, weekly, quarterly, and semi-annual (every 6 months) schedule.

Use this maintenance schedule as a guide. You may need to shorten the time of the maintenance schedule, depending on how often you use the sprue picker.
Follow all precautions and warnings when working on the equipment.

WARNING: Improper installation, operation, or servicing may result in equipment damage or personal injury.
This equipment should only be installed, adjusted, and serviced by qualified technical personnel who are familiar with the construction, operation, and potential hazards of this type of machine.

Be sure the sprue picker has proper clearance to avoid structures, utilities, overhead cranes, material hoppers and loading pipes, as well as other machines and equipment.

Be sure that the maximum envelope is clearly marked and protected from entry by personnel during operation. The maximum envelope is the volume of space encompassing the maximum designed movement of ALL robot parts, including the end of arm tooling, work piece and attachments.

WARNING: Voltage Hazard

This equipment is powered by alternating current, as specified on the machine serial tag and data plate.

Device must be properly grounded. Improper grounding can result in severe personal injury and erratic machine operation.

Always disconnect and lock out the incoming main power source to the sprue picker before performing non-standard operating procedures such as routine maintenance. Only qualified personnel should perform troubleshooting procedures that require access to the electrical enclosure while power is on.

All wiring, disconnects, and fuses should be installed by qualified electrical technicians in accordance with electrical codes in your region. Always maintain a safe ground. Do not operate the equipment at power levels other than what is specified on the machine serial plate.

WARNING: High speed moving parts.

Do not enter maximum envelope area while machine is operating. The maximum envelope is the volume of space encompassing the maximum designed movement of ALL robot parts, including the end of arm tooling, work piece and attachments.

Do not operate machine unless interlocks/safety devices are in place and function properly.

Sprue picker may drop load. Do not walk under robot/ load. Failure to follow instructions could result in injury.

PREVENTATIVE MAINTENANCE SCHEDULE

To maintain the best performance, follow this maintenance schedule.

● Daily

❒ **Inspecting filter regulator unit**
Check the bowl for water and contamination and for correct pressure.

❒ **Checking hoses and cables**
Check for kinks, cuts, and tears. Replace as needed.

❒ **Inspecting shock absorbers and cushions**
Make sure they are operating smoothly.

❒ **Checking gripper return spring**
Check that the gripper return spring is operating properly.

❒ **Checking residue buildup**
Inspect the shafts and gripper for buildup of plastic residue. Clean as necessary.

❒ **Checking interlock functions**
Make sure the interlock functions are working properly.

❒ **Checking part verification**
Check that the parts verification is working properly.

● Weekly, or as often as needed.

❒ **Inspecting fittings and mounting hardware**
Check all fittings, screws, and component mounting hardware for tightness. Tighten as needed.

❒ **Checking gripper mounting screw**
Check the gripper mounting screw for tightness. Tighten as needed.

❒ **Inspecting grease fittings**
Check grease fittings and grease with lithium soap grease No. 1 or 2, as needed.

❒ **Checking the safety latch cylinder**
Make sure the safety latch cylinder is working properly.

❒ **Testing the Emergency Stop button**
Verify that the emergency stop works properly.

PREVENTATIVE MAINTENANCE SCHEDULE

❒ **Checking angle of rotation**
Check for correct angle of rotation of the arm. Adjust as necessary.

❒ **Checking timer settings**
Check that settings have not changed. Adjust as needed.

❒ **Verifying sequence**
Check that sprue picker is performing the correct sequences. Correct as needed.

● Monthly

❒ **Inspecting the filter regulator**
Check that the filter regulator is set at the correct pressure. Check the filter and clean or replace it as needed.

❒ **Checking the solenoid valves**
Check that the solenoid valves are working properly. Replace as needed.

❒ **Inspecting the gripper for wear**
Check the gripper fingers for wear. Replace as needed.

❒ **Checking the exhaust filter**
Check the filter and clean or replace it as needed.

❒ **Examining the suction cups**
If equipped with end-of-arm tooling, inspect the suction cups and replace if worn or damaged.

❒ **Inspecting electrical terminals**
Check all electrical terminals for tightness; adjust as needed. See Checking Electrical Connections, page 5-6.

❒ **Checking all electrical cables**
Inspect all electrical cables for cuts, burns, and abrasions. Replace as needed.

❒ **Inspecting hand pendant display**
Check to make sure no LCD display is functioning correctly. Replace as needed.

CHECKING ELECTRICAL CONNECTIONS

WARNING: Electrical hazard
Before performing any work on this product, disconnect and lock out electrical power sources to prevent injury from unexpected energization or start-up.

WARNING: Improper installation, operation, or servicing may result in equipment damage or personal injury.
This equipment should only be installed, adjusted, and serviced by qualified technical personnel who are familiar with the construction, operation, and potential hazards of this type of machine.

All wiring, disconnects, and fuses should be installed by qualified electrical technicians in accordance with electrical codes in your region. Always maintain a safe ground. Do not operate the equipment at power levels other than what is specified on the machine serial tag and data plate.

Electrical Diagrams are in the Appendix, beginning on page A-9.

1 Be sure the main power is disconnected and the sprue picker is locked out. Always disconnect and lock out the main power source before opening the unit or servicing.

2 Open the electrical enclosure.

3 Inspect all wires and connections.
Look for loose wires, burned contacts, and signs of overheated wires. Have a qualified electrician make any necessary repairs or replacements.

4 Close the electrical enclosure door.

5 Inspect the exterior power cords and cables.
Cords should not be crimped, exposed, or rubbing against the frame. If the interface cable or hand pendant cable runs along the floor, make sure it is not positioned where it could rest in pooling water or could be run over and cut by wheels or casters.

TROUBLESHOOTING

- *Before Beginning 6-2*
- *A Few Words of Caution 6-2*
- *Identifying the Cause of a Problem 6-2*
- *Answering an Alarm 6-3*
- *The Sprue Picker Does Not Cycle 6-4*
- *The Mold is Not Working Properly 6-5*
- *The Arm is Not Working Properly 6-6*
- *Strip Motion is Not Working 6-7*
- *There is No Swing Motion 6-8*
- *The Gripper Does Not Work 6-9*
- *There is No Vacuum 6-10*

BEFORE BEGINNING

You can avoid most problems by following the recommended installation, operation and maintenance procedures outlined in this User Guide. If you have a problem, this section will help you determine the cause and tell you how to fix it.

Find any wiring, parts, and assembly diagrams that were shipped with your equipment. The diagrams will note any custom features or options not covered in this User Guide.

Verify that you have all instructional materials related to the sprue picker. Additional details about troubleshooting and repairing specific components are found in these materials.

Check that you have manuals for other equipment connected in the system. Troubleshooting may require investigating other equipment connected with the sprue picker.

A FEW WORDS OF CAUTION

WARNING: Improper installation, operation, or servicing may result in equipment damage or personal injury.
This equipment should only be installed, adjusted, and serviced by qualified technical personnel who are familiar with the construction, operation, and potential hazards of this type of machine.
All wiring, disconnects, and fuses should be installed and adjusted by qualified electrical technicians in accordance with electrical codes in your region. Always maintain a safe ground. Do not operate the equipment at power levels other than what is specified on the machine serial tag and data plate.

WARNING: Electrical hazard
Before performing maintenance or repairs on this product, disconnect and lock out electrical power sources to prevent injury from unexpected energization or start-up.

IDENTIFYING THE CAUSE OF A PROBLEM

The Troubleshooting section covers problems directly related to the operation and maintenance of the sprue picker. This section does not provide solutions to problems that originate with other equipment. Additional troubleshooting help can be found in manuals supplied with the other equipment.

ANSWERING AN ALARM

When an error occurs during operation, the sprue picker stops, an alarm sounds and the error code displays on the hand control. Press the Stop button to silence the alarm. Check this table for a description of the error:

Error Display	Area of problem
LS1 SWITCH ERROR OR NOT ACTUATED CHECK LS1 SWITCH	LS-1 swing-out proximity switch error or the switch was not actuated.
LS2 SWITCH ERROR OR NOT ACTUATED CHECK LS2 SWITCH	LS-2 swing-in proximity switch error or the switch was not actuated.
LS3 SWITCH ERROR OR NOT ACTUATED CHECK LS3 SWITCH	LS-3 arm-up proximity switch error or the switch was not actuated.
LS4 SWITCH ERROR OR NO PARTS VERIF. CHECK LS4 SWITCH	LS-4 part (grip) verification switch error or the switch was not actuated.
TIMER#08 ERROR CYCLE TIM EXCEEDED CHECK TIM 08	The Timer 08 cycle time is over.
LSO SWITCH ERROR OR INTERUP. SIGNAL CHECK LSO SWITCH	LS-0 mold fully open switch error.
LSD SWITCH ERROR OR NOT ACTUATED CHECK LSD SWITCH	LS-D arm descend end proximity switch error or the switch was not actuated.
LSG SWITCH ERROR OR NOT ACTUATED CHECK LSG SWITCH	LS-G safety gate signal error.
LSP SWITCH ERROR OR NOT ACTUATED CHECK LSP SWITCH	LS-P vacuum verification switch error or the switch was not actuated.
LSH SWITCH ERROR OR NOT IN HOME CHECK LSH SWITCH	LS-H robot home position switch error or sprue picker not at home position.
OUTPUT SHORT	Short circuit in the solenoid valve(s) output circuit.

THE SPRUE PICKER DOES NOT CYCLE

There are several reasons the sprue picker does not cycle. You need to check electrical connections, fuses, and the automatic setting.

Symptom	Possible cause	Solution
◆ **The sprue picker does not cycle.**	**Electrical connections are not correct.**	**Check that:** ❒ The sprue picker is plugged into a power source. ❒ The main power source is on. ❒ The interface cables are connected. ❒ The fuses are good. ❒ The power to the press is on.
◆ **Automatic operation is not available.**	**The press is not in auto.**	Check that the interface wiring is properly connected.
	The sprue picker is not in Home position.	Return the sprue picker to Home using the manual button on the hand control.

THE MOLD IS NOT WORKING PROPERLY

The common problems you will see with the mold are that it will not close or it will not open. You need to check settings and electrical connections.

Symptom	Possible cause	Solution
◆ **The mold does not close.**	**The arm is not in the full up position, or at the swing outward end.**	Check the Arm Up (LS-3) and Swing Outward End (LS-1) switches and adjust as needed.
	The safety interlock is on.	Check the output and wiring.
	The part verification signal is not working.	Check that the part verification is on. Replace the switch if necessary.
	The optional cycle start signal is not working.	Check the output and wiring.
◆ **The mold does not open.**	**The arm is not in the full up position, or at the swing outward end.**	Check the Arm Up (LS-3) and Swing Outward End (LS-1) switches and adjust as needed.
	The safety interlock is on.	Check the output and wiring.

THE ARM IS NOT WORKING PROPERLY

The problems you will see with the arm is that it will not extend or retract properly. Check electrical wiring, switches, valves, and air lines.

Symptom	Possible cause	Solution
◆ **There is no arm extension (no arm down).**	**There is no air pressure.**	Check air supply to the sprue picker. Check for leaks.
	The mold is not fully open.	Check that the interface wiring is correct.
	The sprue picker is not swung fully in or fully out.	Check the LS-1 and LS-2 switches and adjust as necessary.
	Vertical stroke adjustment block is set too low.	Loosen stroke adjustment block and set higher to correct stroke.
	The arm down flow control is shut off.	Adjust the down speed control; replace as needed.
	The main arm solenoid valve is not functioning.	Replace the main arm solenoid valve.
	The air lines/seals are damaged or leaking.	Check air lines and seals; replace as needed.
◆ **There is no arm retraction (no arm up).**	**There is no air pressure.**	Check air supply to the sprue picker.
	The up solenoid is not functioning.	Replace the up solenoid valve.

STRIP MOTION IS NOT WORKING

When the strip is not working properly, it does not move forward or backward. You need to adjust the strip speed control, replace the valve, or check the air lines.

Symptom	Possible cause	Solution
◆ **There is no strip forward motion.**	**There is no air pressure.**	Check air supply to the sprue picker. Check for leaks.
	Strip stroke adjustment set too short.	Check strip stroke adjustment for proper distance.
	The strip forward speed control is shut off.	Adjust the strip forward speed control; replace as needed.
	The strip valve is not functioning.	Check the strip valve and replace as needed.
	The air lines/seals are damaged or leaking.	Check air lines and seals and replace as needed.
◆ **There is not strip backward motion.**	**There is no air pressure.**	Check air supply to the sprue picker. Check for leaks.
	Strip stroke adjustment set too short.	Check strip stroke adjustment for proper distance.
	The strip backward speed control is shut off.	Adjust the strip backward speed control; replace as needed.
	The strip valve is not functioning.	Check the strip valve and replace as needed.
	The air lines/seals are damaged or leaking.	Check air lines and seals and replace as needed.

THERE IS NO SWING MOTION

Causes for the swing not moving are due to switches and air lines. Check switches and check for air leaks.

Symptom	Possible cause	Solution
◆ **The swing does not move.**	**There is no air pressure.**	Check the air supply to the sprue picker.
	The arm is not in the full up position.	Check the arm up switch and adjust as needed.
	The swing inhibitor devices used during shipping is still attached.	Remove the swing bracket and the screws used during shipping. See page 3-5.
	Part verification is not on (during Auto mode).	Check and adjust the verification switches as needed.
	The swing flow controls are shut off.	Adjust the swing speed control; replace as needed.
	The air lines/seals are damaged or leaking.	Check air lines and seals and replace as needed.

When the gripper does not grab the sprue, check the solenoid, switches, and the air lines.

THE GRIPPER DOES NOT WORK

Symptom	Possible cause	Solution
◆ **The gripper does not work.**	**There is no air pressure.**	Check the air supply; adjust as needed.
	The arm is not in mold or extended over gate (during Manual mode).	Extend the arm in the mold or over gate area.
	The grip solenoid is not working properly.	Replace the grip solenoid.
	The air lines/seals are damaged or leaking.	Check air lines and seals and replace as needed.
	The part/sprue is sticking to the mold.	Adjust the ejector stroke. Correct the mold problem.
	Main grip is not selected in Program mode.	Place grip on in Program mode.
	Gripper is faulty.	Check gripper for broken spring or cracked housing. Replace as needed.

THERE IS NO VACUUM

When the vacuum is not working, check settings, air line problems, and bad solenoids.

Symptom	Possible cause	Solution
◆ **There is no vacuum.**	**The air pressure is incorrect.**	Check the air pressure. Adjust as needed.
	The mode setting is incorrect.	Set the mode for vacuum.
	The vacuum solenoid is not working properly.	Replace the vacuum solenoid.
	The air lines/seals are damaged or leaking.	Check the air lines and seals and replace as needed.
	The part/sprue is sticking to the mold.	Adjust the ejector stroke. Correct the mold problem.

WE'RE HERE TO HELP

Conair has made the largest investment in customer support in the plastics industry. Our service experts are available to help with any problem you might have installing and operating your equipment. Your Conair sales representative also can help analyze the nature of your problem, assuring that it did not result from misapplication or improper use.

HOW TO CONTACT CUSTOMER SERVICE

To contact Customer Service personnel, call:

From outside the United States, call: 814-437-6861

You can commission Conair service personnel to provide on-site service by contacting the Customer Service Department. Standard rates include an on-site hourly rate, with a one-day minimum plus expenses.

BEFORE YOU CALL ...

If you do have a problem, please complete the following checklist before calling Conair:

- ❒ Make sure you have all model, serial and parts list numbers for your particular equipment. Service personnel will need this information to assist you.
- ❒ Make sure power is supplied to the equipment.
- ❒ Make sure that all connectors and wires within and between the sprue picker and related components have been installed correctly.
- ❒ Check the troubleshooting guide of this manual for a solution.
- ❒ Thoroughly examine the instruction manual(s) for associated equipment, especially controls. Each manual may have its own troubleshooting guide to help you.
- ❒ Check that the equipment has been operated as described in this manual.
- ❒ Check accompanying schematic drawings for information on special considerations.

Additional manuals and prints for your Conair equipment may be ordered through the Customer Service or Parts Departments for a nominal fee.

EQUIPMENT GUARANTEE

Conair guarantees the machinery and equipment on this order, for a period as defined in the quotation from date of shipment, against defects in material and workmanship under the normal use and service for which it was recommended (except for parts that are typically replaced after normal usage, such as filters, liner plates, etc.). Conair's guarantee is limited to repairing or replacing, at our option, the part or parts determined by us to be defective after examination. The customer assumes the cost of transportation of the part or parts to and from the factory.

PERFORMANCE WARRANTY

Conair warrants that this equipment will perform at or above the ratings stated in specific quotations covering the equipment or as detailed in engineering specifications, provided the equipment is applied, installed, operated and maintained in the recommended manner as outlined in our quotation or specifications.

Should performance not meet warranted levels, Conair at its discretion will exercise one of the following options:

- Inspect the equipment and perform alterations or adjustments to satisfy performance claims. (Charges for such inspections and corrections will be waived unless failure to meet warranty is due to misapplication, improper installation, poor maintenance practices or improper operation.)
- Replace the original equipment with other Conair equipment that will meet original performance claims at no extra cost to the customer.
- Refund the invoiced cost to the customer. Credit is subject to prior notice by the customer at which time a Return Goods Authorization Number (RGA) will be issued by Conair's Service Department. Returned equipment must be well crated and in proper operating condition, including all parts. Returns must be prepaid.

Purchaser must notify Conair in writing of any claim and provide a customer receipt and other evidence that a claim is being made.

WARRANTY LIMITATIONS

Except for the Equipment Guarantee and Performance Warranty stated above, Conair disclaims all other warranties with respect to the equipment, express or implied, arising by operation of law, course of dealing, usage of trade or otherwise, including but not limited to the implied warranties of merchantability and fitness for a particular purpose.

ADDING A SECOND DESCENT

You can add a second descent slowdown circuit to an MX model sprue picker. The two valves that are part of the second descent slowdown circuit are the vertical valve and the swing valve.

The second descent slowdown valve is an air actuated valve. It is actuated by the swing motion. When the swing motion swings out, the pressure used to swing the arm out energizes the slowdown valve. When the arm descends in the swing out position, the exhaust of the vertical is diverted through the second descent slowdown valve through a metering valve.

This metering valve creates a second slower speed.
When the arm swings back in, the pressure to the second descent slowdown valve is no longer present and the air for the vertical cylinder goes straight through the second descent slowdown valve without being metered.

Warning
The air supply to the sprue picker must be disconnected and drained from the machine before doing any installation or maintenance. Failure to heed this warning may result in personal injury.

ADDING A SECOND DESCENT: PREPARATION

To add a second descent slowdown circuit to and MX sprue picker:

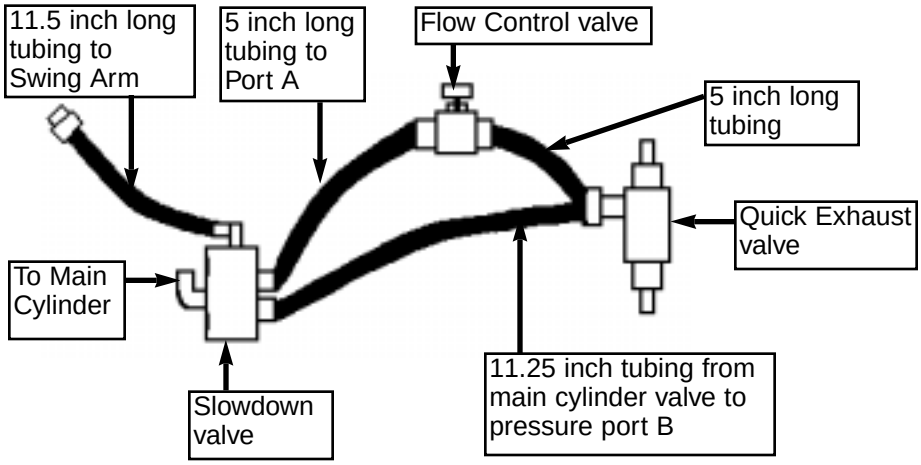
1 **Shut off the air supply** to the sprue picker.

2 **Disconnect the air supply** to the sprue picker.

3 **Apply thread sealer to all unsealed threads.**

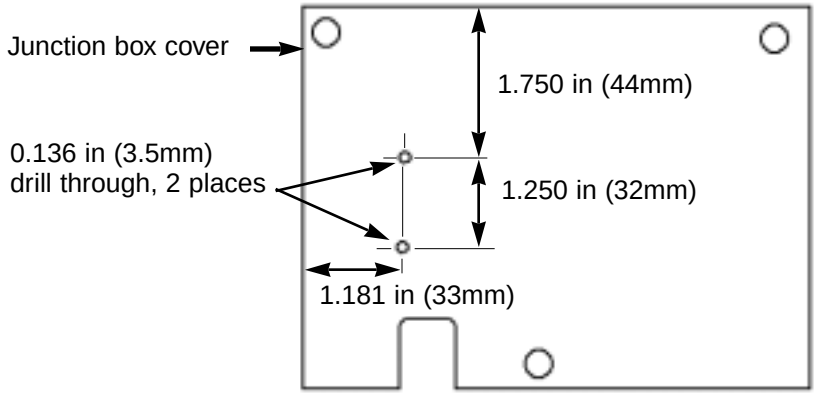
4 **Cut the tubing and attach.**

Tubing	Cut Length, in.	Location
MX60 to MX150		
8mm	5	Slowdown valve to Flow Control valve
8mm	5	Flow Control valve to Quick Exhaust valve
8mm	11.25	Slowdown valve to Quick Exhaust valve
4mm	11.5	Slowdown valve to Swing Arm
6mm	---	Slowdown valve to Main cylinder
MX250 to MX550		
8mm	5	Slowdown valve to Flow Control valve
8mm	5	Flow Control valve to Quick Exhaust valve
8mm	11.25	Slowdown valve to Quick Exhaust valve
6mm	11.5	Slowdown valve to Swing Arm
8mm	---	Slowdown valve to Main cylinder
MX350T to MX550T		
8mm	5	Slowdown valve to Flow Control valve
8mm	5	Flow Control valve to Quick Exhaust valve
8mm	11.25	Slowdown valve to Quick Exhaust valve
6mm	11.5	Slowdown valve to Swing Arm
8mm	---	Slowdown valve to Main cylinder


11.5 inch long tubing to Swing Arm
5 inch long tubing to Port A
Flow Control valve
5 inch long tubing
Quick Exhaust valve
To Main Cylinder
Slowdown valve
11.25 inch tubing from main cylinder valve to pressure port B

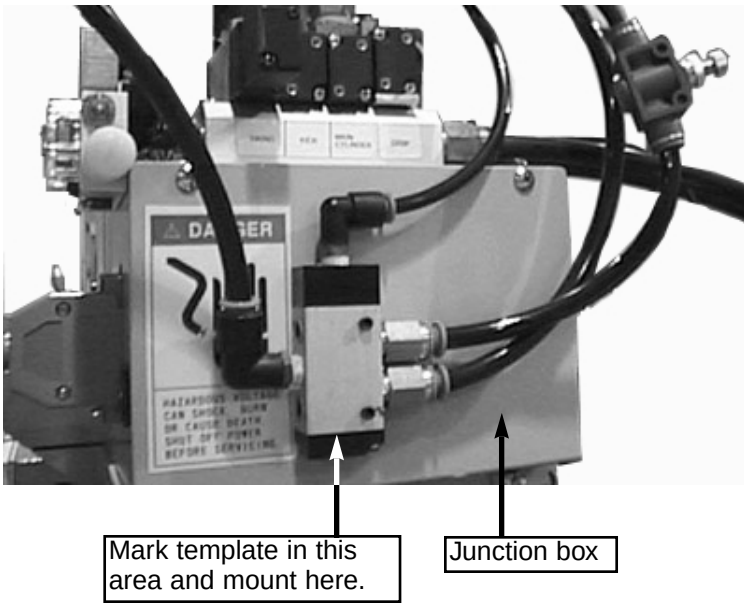
ADDING A SECOND DESCENT: ATTACHING

1 **Mark the template on the junction box cover.**
Remove the junction box cover and, using the template that comes with the second descent, mark the template on the junction box.



2 **Drill the holes.**

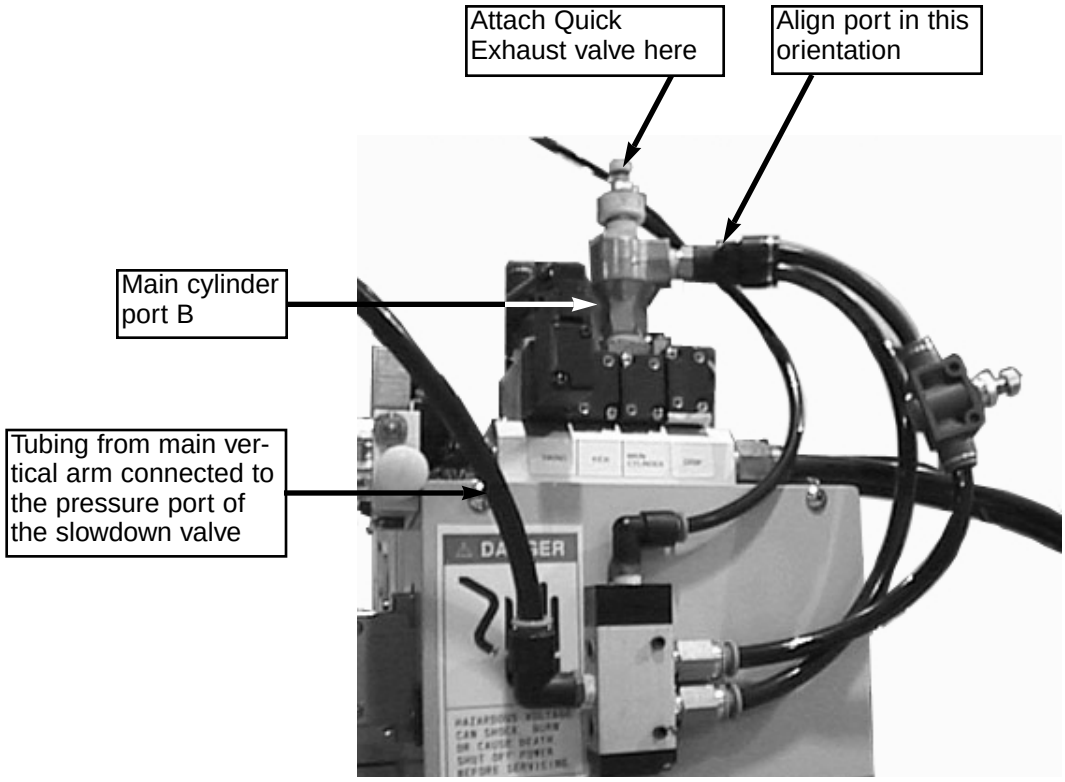
3 **Mount the valve to the junction box**
below the valve assembly (see picture) using the mounting screws.



4 **Replace the cover.**

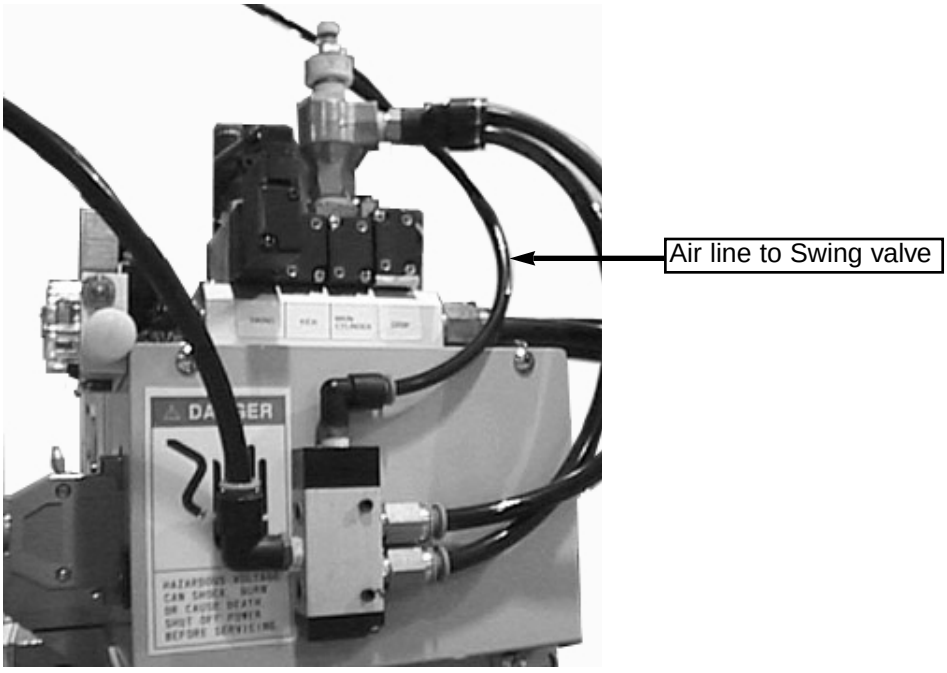
ADDING A SECOND DESCENT: CONNECTING QUICK EXHAUST

1. **Disconnect the tubing from the main vertical** arm at the manifold connection.
2. **Connect this hose to the pressure port on the** slowdown valve.
3. **Remove flow control and fitting from main** cylinder valve on the manifold at port B.
4. **Remove Y fitting from quick exhaust valve,** supplied with kit; apply thread sealer.
5. **Thread quick exhaust valve into main cylinder** at port B. Be careful to not overtighten. Align port as shown.
6. **Reconnect Y fitting to quick-exhaust valve** and reconnect air lines to Y fitting.


Attach Quick Exhaust valve here
Align port in this orientation
Main cylinder port B
Tubing from main vertical arm connected to the pressure port of the slowdown valve

ADDING A SECOND DESCENT: CONNECTING SWING VALVE

1. **Locate Swing valve port A.**
2. **Cut tubing about 4 inches (102mm) from the fitting.**
3. **Insert Y fitting.**
4. **Connect air line from top of slowdown valve into Y fitting.**

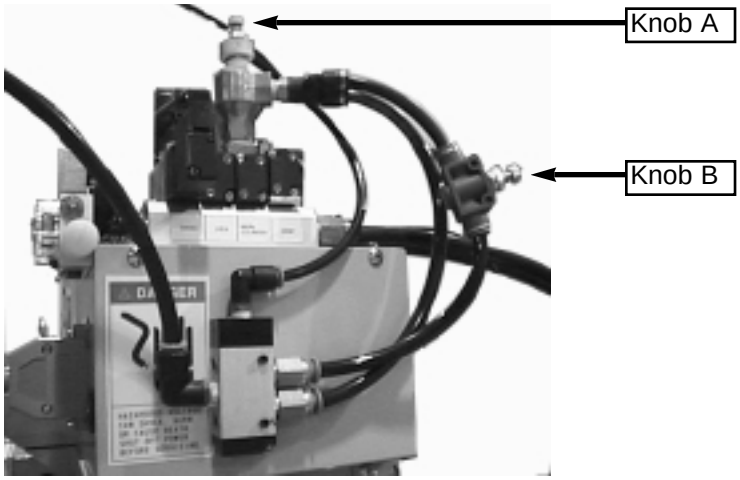


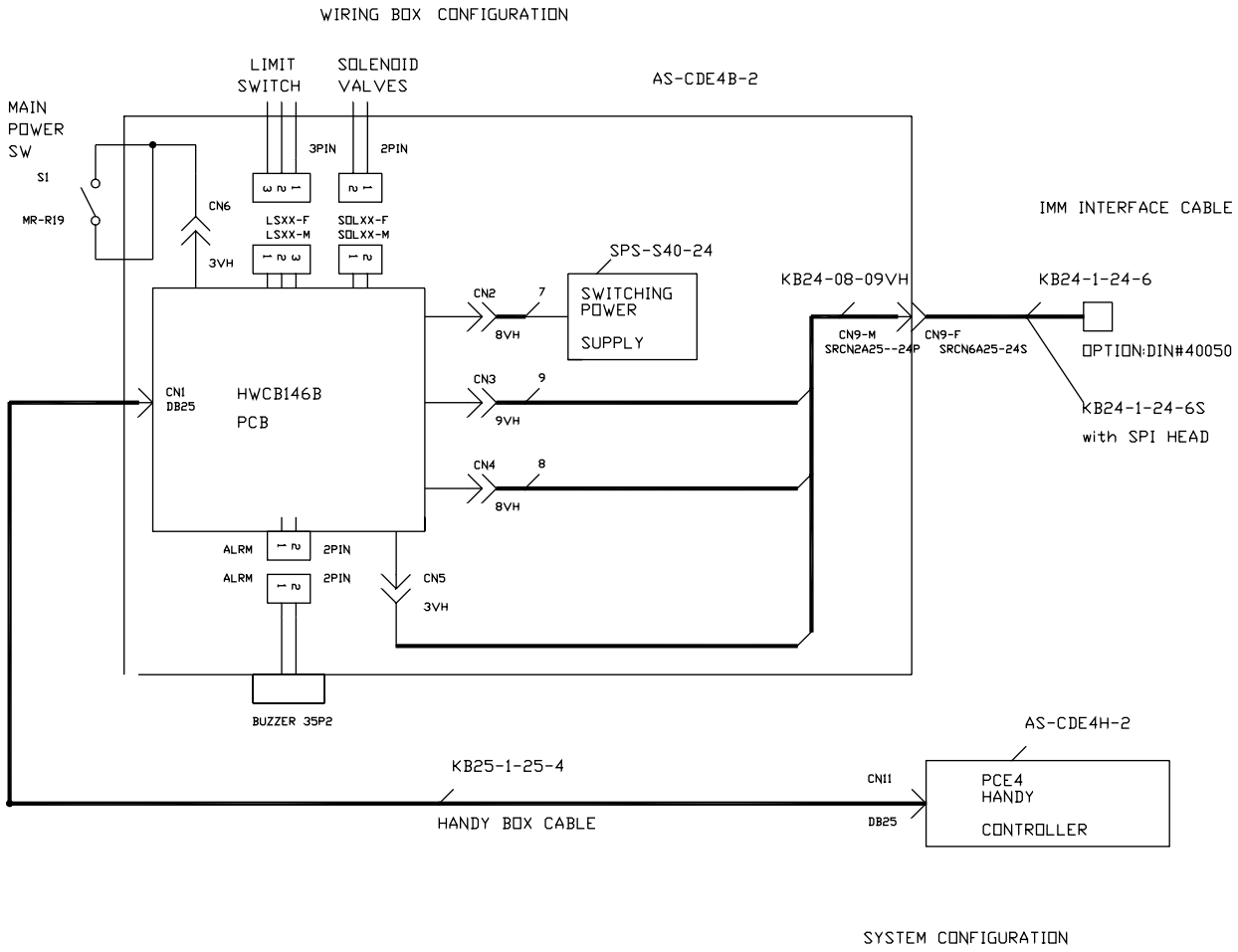
ADDING A SECOND DESCENT: ADJUSTMENTS

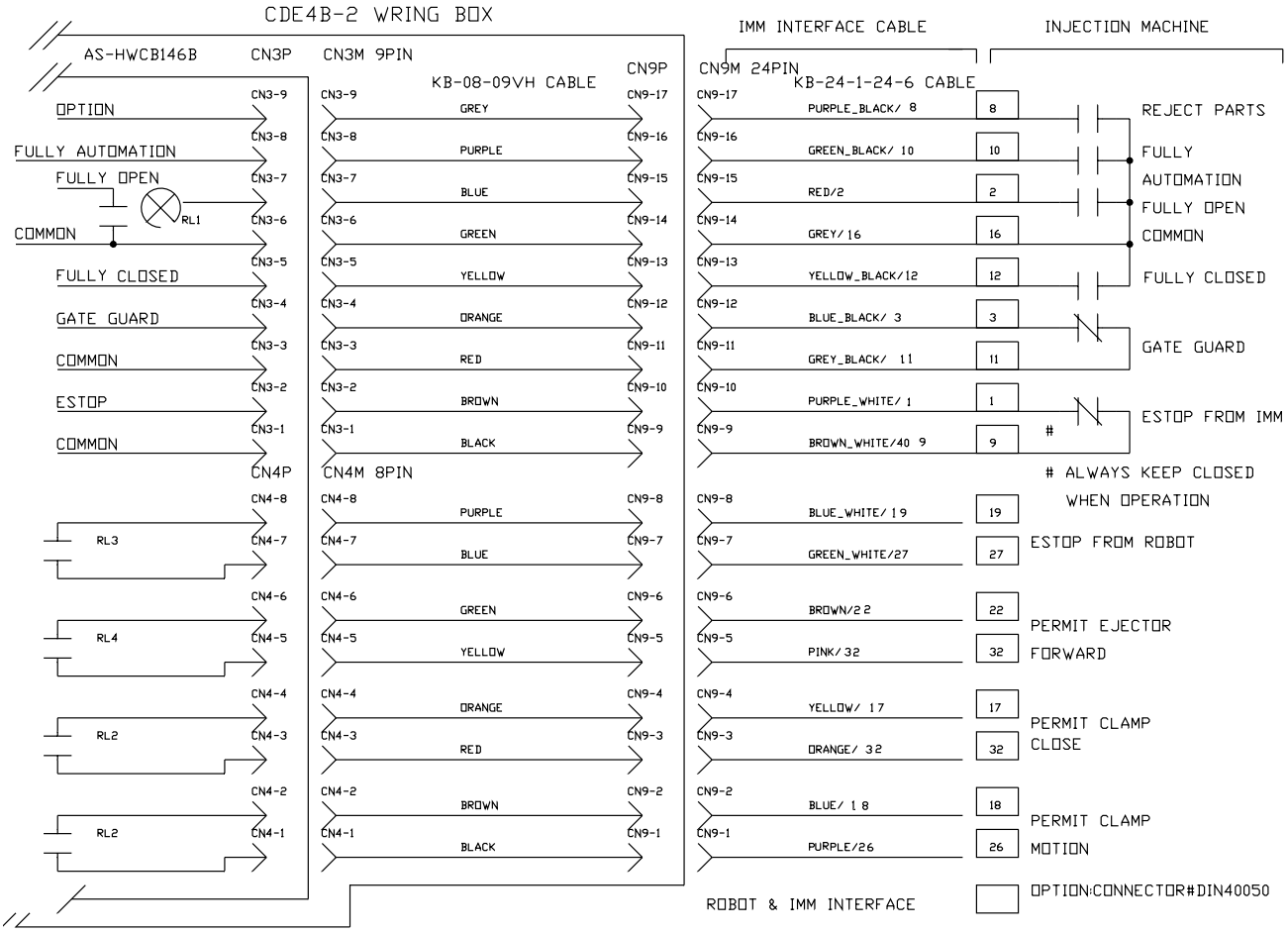
To adjust the speed of the second descent slowdown valve:

1 **Turn Knob A (overall speed)**
Turn Knob A clockwise to slow the speed of the arm and counterclockwise to increase the speed of the arm.

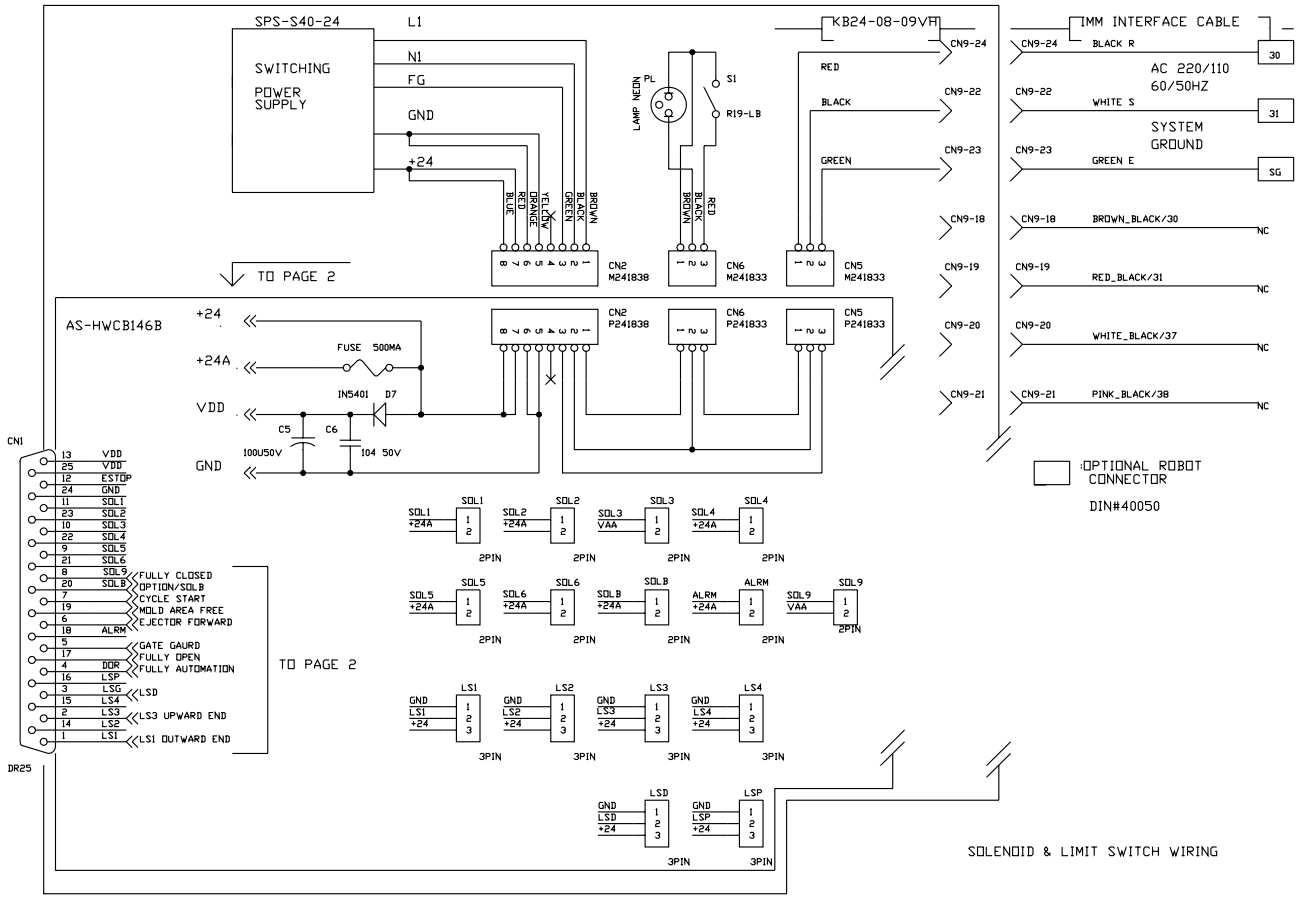
2 **Turn Knob B (second descent speed)**
To adjust the speed of the arm for second descent, turn Knob B clockwise to slow second descent speed and counterclockwise to increase second descent.

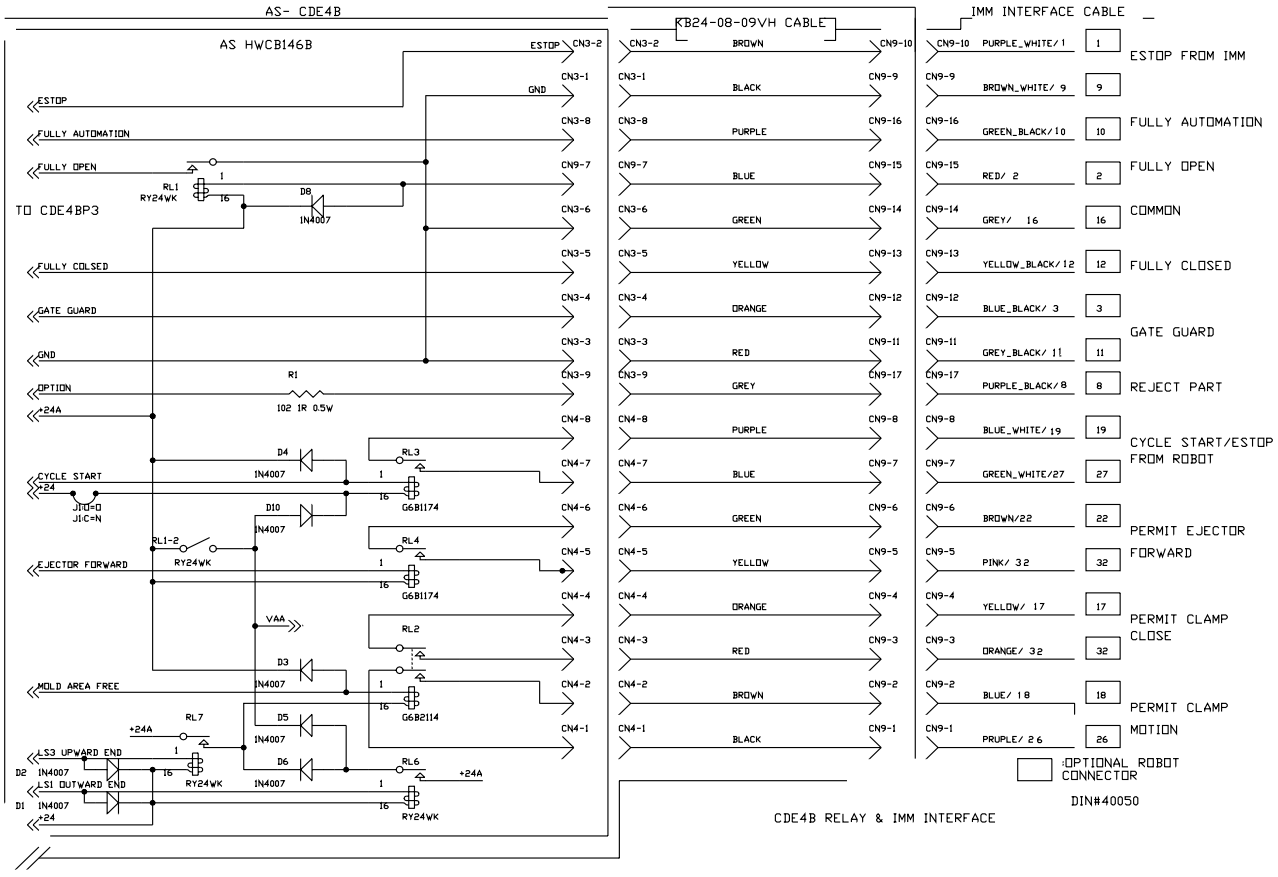



WIRING BOX CONFIGURATION
LIMIT SWITCH
SOLENOID VALVES
AS-CDE4B-2
MAIN POWER SW
S1
MR-R19
CN6
3VH
3PIN
2PIN
LSXX-F
LSXX-M
SOLXX-F
SOLXX-M
SPS-S40-24
SWITCHING POWER SUPPLY
CN2
7
8VH
CN3
9
9VH
CN4
8
8VH
CN1
DB25
HWCB146B
PCB
ALRM
2PIN
CN5
3VH
BUZZER 35P2
KB24-08-09VH
CN9-M
SRCN2A25--24P
CN9-F
SRCN6A25-24S
IMM INTERFACE CABLE
KB24-1-24-6
OPTION:DIN#40050
KB24-1-24-6S
with SPI HEAD
AS-CDE4H-2
KB25-1-25-4
HANDY BOX CABLE
CN11
DB25
PCE4
HANDY
CONTROLLER
SYSTEM CONFIGURATION



CAUTION: Equipment hazard.
Do not plug an MX Sprue Picker with a PC-E III Control into an interface wired for a PC-E IV Control SPI interface.
Do not plug an MX Sprue Picker with a PC-E IV Control into an interface wired for a PC-E III Control interface.
Damage will occur! Call Conair Service if you are unsure or have any questions.

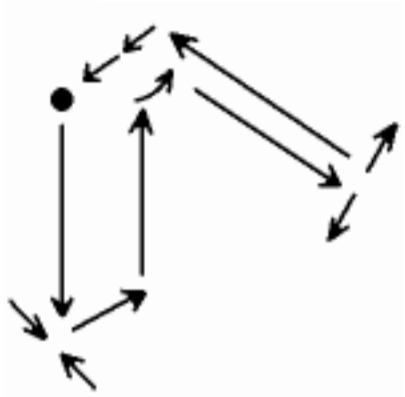
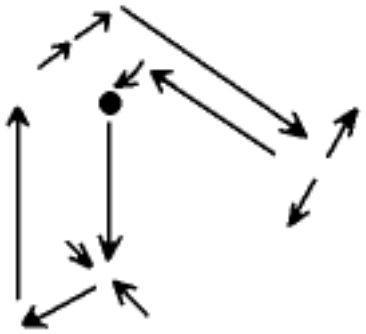
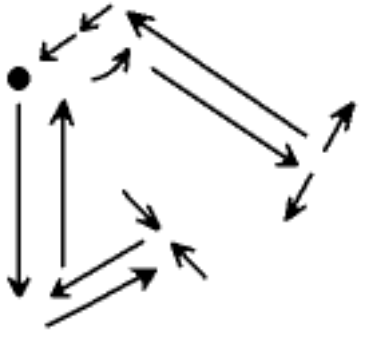

SPS-S40-24
SWITCHING POWER SUPPLY
L1
N1
FG
GND
+24
KB24-08-09VH
IMM INTERFACE CABLE
AC 220/110 60/50HZ
SYSTEM GROUND
OPTIONAL ROBOT CONNECTOR
DIN#40050
TO PAGE 2
AS-HWCB146B
FUSE 500MA
IN5401
D7
C5
C6
100U50V
104 50V
CN1
DR25
FULLY CLOSED
OPTION/SOLB
CYCLE START
MOLD AREA FREE
EJECTOR FORWARD
GATE GAURD
FULLY OPEN
FULLY AUTOMATION
LS1 OUTWARD END
LS3 UPWARD END
SOLENOID & LIMIT SWITCH WIRING



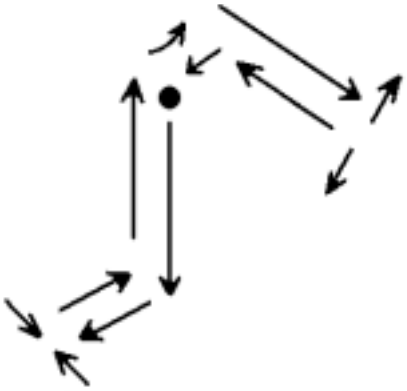
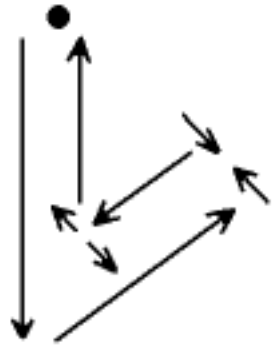
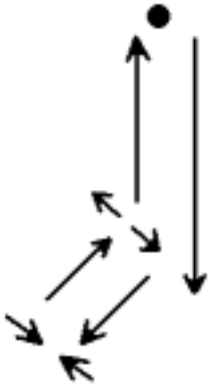
CAUTION: Equipment hazard.
Do not plug an MX Sprue Picker with a PC-E III Control into an interface wired for a PC-E IV Control SPI interface.
Do not plug an MX Sprue Picker with a PC-E IV Control into an interface wired for a PC-E III Control interface.
Damage will occur! Call Conair Service if you are unsure or have any questions.

MOTION SEQUENCES

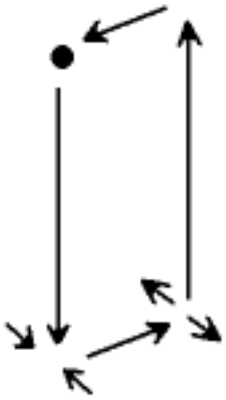
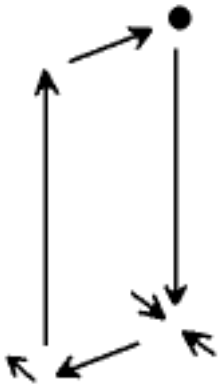
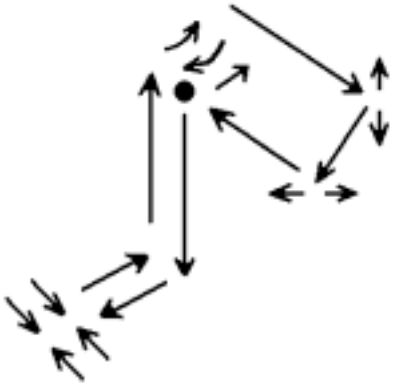
The motion sequence is the movement pattern that the arm travels.

Motion Sequence	LCD Displays	Movement Steps:	
P01 MUX	P01 MUX FIXED/MOV.: MOV-ABLE U/L MOTION: U SWING W/WO: W	1. Arm extend movable mold side 2. Grip part/sprue 3. Strip 4. Arm retract 5. Swing outward 6. Arm second extend 7. Release part/sprue 8. Arm second retract 9. Swing inward 10. Strip to home position	
P02 FUX	P02 FUX FIXED/MOV: FIXED U/L MOTION: U SWING W/WO: W	1. Arm extend fixed mold side 2. Grip part/sprue 3. Strip 4. Arm retract 5. Strip back 6. Swing outward 7. Arm second extend 8. Release part/sprue 9. Arm second retract 10. Swing inward	
P03 MLX	P03 MLX FIXED/MOV.: MOV-ABLE U/L MOTION: L SWING W/WO: W	1. Arm extend movable mold side 2. Strip (approach) 3. Grip part/sprue 4. Strip back 5. Arm retract 6. Swing outward 7. Arm second extend 8. Release sprue/part 9. Arm second retract 10. Swing inward	

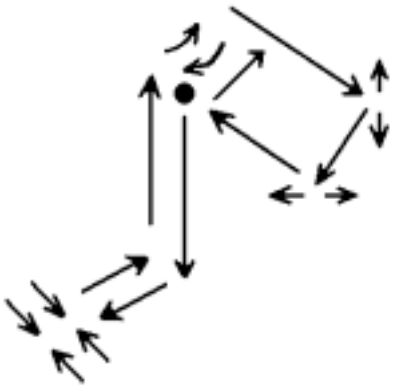
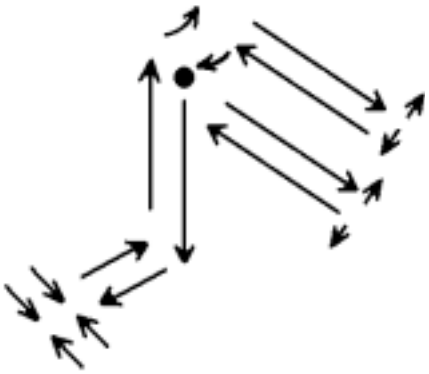
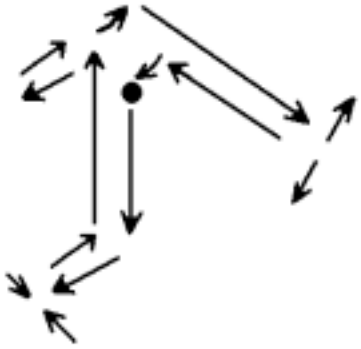
MOTION SEQUENCES

	Motion Sequence	LCD Displays	Movement Steps:
	P04 FLX	P04 FLUX FIXED/MOV.: FIXED U/L MOTION: L SWING W/WO: W	1. Arm extend fixed mold side 2. Strip (approach) 3. Grip part/sprue 4. Strip back 5. Arm retract 6. Swing outward 7. Arm second extend 8. Release part/sprue 9. Arm second retract 10. Swing inward
	P05 MLB	P05 MLB FIXED/MOV: MOV-ABLE U/L MOTION: L SWING W/WO: WO	1. Arm extend movable mold side 2. Strip (approach) 3. Grip part/sprue 4. Strip back 5. Release part/sprue 6. Arm retract
	P06 FLB	P06 FLB FIXED/MOV.: FIXED U/L MOTION: L SWING W/WO: WO	1. Arm extend fixed mold side 2. Strip (approach) 3. Grip part/sprue 4. Strip back 5. Release sprue/part 5. Arm retract

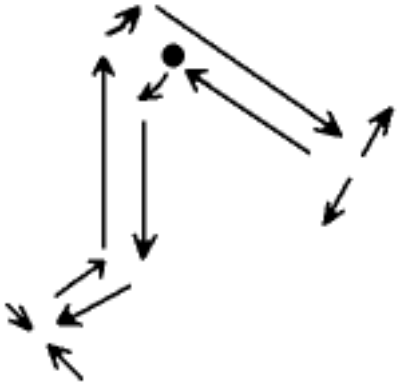
MOTION SEQUENCES

Motion Sequence	LCD Displays	Movement Steps:	
P07 MUB	P07 MUB FIXED/MOV.: MOVABLE U/L MOTION: U SWING W/WO: WO	1. Arm extend movable mold side 2. Grip part/sprue 3. Strip 4. Arm retract 5. Swing outward 6. Arm second extend 7. Release part/sprue 8. Arm second retract 9. Swing inward 10. Strip to home position	
P08 FUB	P08 FUB FIXED/MOV: FIXED U/L MOTION: U SWING W/WO: WO	1. Arm extend fixed mold side 2. Grip part/sprue 3. Strip 4. Arm retract 5. Strip back 6. Swing outward 7. Arm second extend 8. Release part/sprue 9. Arm second retract 10. Swing inward	
P09 FLK	P09 FLK FIXED/MOV.: FIXED U/L MOTION: L+SWING SWING W/WO: PART FIRST	1. Arm extend movable mold side 2. Strip (approach) 3. Grip part/sprue 4. Strip back 5. Arm retract 6. Swing outward 7. Arm second extend 8. Release sprue/part 9. Arm second retract 10. Swing inward	

MOTION SEQUENCES

	Motion Sequence	LCD Displays	Movement Steps:
	P10 FLR	P10 FLR FIXED/MOV.: FIXED U/L MOTION: L+ SWING SWING W/WO: SPRUE 1ST	1. Arm extend fixed mold side 2. Strip (approach) 3. Grip part/sprue 4. Strip back 5. Arm retract 6. Swing outward 7. Arm second extend 8. Release part/sprue 9. Arm second retract 10. Swing inward
	P11 FL3	P11 FL3 FIXED/MOV: FIXED U/L MOTION: L + SWING OPT DESCNT: 3RD	1. Arm extend movable mold side 2. Strip (approach) 3. Grip part/sprue 4. Strip back 5. Release part/sprue 6. Arm retract
	P012 FLC	P12 FLC FIXED/MOV.: FIXED U/L MOTION: L + SWING OPT CUT: NIPPER	1. Arm extend fixed mold side 2. Strip (approach) 3. Grip part/sprue 4. Strip back 5. Release sprue/part 5. Arm retract

MOTION SEQUENCES

Motion Sequence	LCD Displays	Movement Steps:	
P13 FLW	P13 FLW FIXED/MOV.: FIXED U/L MOTION: L + SWING OPT POSIT: OUT-WARD	1. Arm extend movable mold side 2. Grip part/sprue 3. Strip 4. Arm retract 5. Swing outward 6. Arm second extend 7. Release part/sprue 8. Arm second retract 9. Swing inward 10. Strip to home position	
P14 LXB	P14 LXB FIXED/MOV: FIXED U/L MOTION: L + SWING SPRU RELS: INMOLD	1. Arm extend fixed mold side 2. Grip part/sprue 3. Strip 4. Arm retract 5. Strip back 6. Swing outward 7. Arm second extend 8. Release part/sprue 9. Arm second retract 10. Swing inward